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FREE UNIVERSITY QUARTERLY

A QUARTERLY
FOR CHRISTIAN KNOWLEDGE
AND LIFE

VOL. V — 1957/1958

FREE UNIVERSITY AMSTERDAM THE NETHERLANDS

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A QUARTERLY FOR CHRISTIAN KNOWLEDGE AND LIFE

FREE UNIVERSITY
AMSTERDAM
THE NETHERLANDS

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The price of subscription is ten guilders a year

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Germany DM. 11.50	DM. 2.90
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THE WISE MEN IN ISRAEL *)

Did the wise men in Israel form a separate order or class in society and did they hold a special office, for instance at court? Can we assign to them a place beside the priests and beside the prophets and beside the kings? Or are we merely to think of wise men without any more, who in that case pursued another profession or office?

Many scholars are of opinion that we have to think of a separate class or order of wise men.

Matthes e. g. thinks of "a class of venerable popular teachers," and speaks of "the wise men of profession"[1]. These men liked to speak in parables. There will certainly have been unions, associations of wise men. They taught in the markets and squares, also in the gates of the cities. In olden times the wise men demanded money in Israel. They were found already in the ancient period. The unions of the wise men may be younger. "But since Isaiah and Jeremiah knew these groups, they must at least have arisen in the time of the kings"[2]. We only know a few names of wise men; this is due to the fact that they pursued their affairs more quietly than the prophets; they did not act as reformers. They drew from experience, whereas the prophets were heroes of faith. The prophet spoke in the name of Jahveh, the wise man spoke in his own name. Nevertheless the wise men were not hostile to Revelation. It is remarkable that the wise men were not particularly national. They held no theocratic views. The prophets, on the contrary, continue to believe in Israel's call. "The wise men deny this call, at least they are altogether silent about it"[3]. They never mention the Messiah. They never address a whole nation, but always speak to special persons individually. The goodness they demand of people, is generally of an everyday nature, not very lofty or elevated. This wisdom is often utilitarian. Jahvism has slightly

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*) Address delivered on the occasion of the seventy-sixth commemoration of the foundation of the Free University on Monday, 22 October, 1956.

[1] J. C. Matthes, De Israëlietische wijzen (Amsterdam, 1911), pp. 1; 3.

[2] Matthes, op. cit. pp. 4—9. The quotation is on page 9.

[3] Matthes, op. cit. pp. 9—16. Quotation on page 16.

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changed the character of this worldly wisdom and by it has ennobled and refined it. And Matthes concludes his chapter on "the wisdom of the wise" by saying: "The wise have made their contribution to removing the barriers for many and to leading a multitude of people on the way of religious devotion, the religion of humanism" [4]).

This characterisation of the wise as a distinct group dates from 1911. It has the advantage of placing them before us in clear outline. The question arises, however, whether there is no danger of our approaching the community of ancient Israel in a too modern Western fashion by operating with sharply defined professions and functions such as we know in our present society. With regard to the priests we need not hesitate. Like the Levites they had a strictly prescribed task. This is also the case with the kings, although it should not be forgotten that even after his designation as king Saul was working in the field with oxen (I Sam. 11 : 5, 6). The prophets are also called to their special office by Jahve, although Amos in the heading of his book is called a sheep breeder, (Amos 1 : 1) and he styles himself: "an herdsman and a dresser of sycomore trees" (Amos 7 : 14). All the same Jahve has taken him from following the flock (Amos 7 : 15). There are, therefore, most certainly spiritual leaders, officials at court with a definite function, soldiers and others. But are the "wise" merely "wise", and nothing else?

It is remarkable that thosce who opt for a special class or rank of wise men on the whole seek this group at present among the so-called "scribes". Volz, for instance, assumes that just as in ancient Egypt, there was also in Israel a school for scribes in which young officials and other lovers of culture were prepared for their duties. He admits that concrete information about such schools is lacking, but it is in the nature of things that such places of education did exist. The most different kinds of sōfĕrim came from this school. Volz speaks about ministers, among whom were the "Schreiberminister", who attended to the correspondence, village scribes, very well-educated authors, politicians. In the days of the prophets there are along with the priests and the people's prophets the "wise men", that is to say the statesmen and politicians, who by their policy, built as it was on wordly foundations, caused the great representatives of religion much work. By the side of these vocational schools a religious school arises in Israel. Isaiah, Jeremiah and Ezekiel were also active as religious educators and gathered a group of disciples around them. Under the influence of the prophets and of the men of the Deuteronomistic group, who gave a clear ethical system, the spiritual education of the people, especially of the young people, was systematically practised. Since the fifth century B. C. the religious school of wisdom arose, in which young men were instructed in the ancestral religion and in the ethics of the law. The teachers in these schools were the wise men. In the long run these scholars formed a class, recognisable in the same way as that of the manual workers or that of the technical artists. They acted as preachers in the streets and the markets. Later on we find them as the scribes of the New Testament [5]).

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[4]) Matthes, op. cit. pp. 17, 19, 22, 24. Quotation on page 30.

Others, too, referring to Egypt, see a connexion between "wise men" and "scribes" and think of a separate class [6]). According to Vriezen, the "scribes" or officials are the class of the "intelligentsia", and in their circle moral science, whose interests are international, is held in great honour [7]).

Yeivin even assumes that in pre-Israelitic Jerusalem there was a school where the administrative staff of the Jebusite kings was educated and that David took into his service many who had been educated there [8]).

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[5]) P. Volz, Hiob und Weisheit² (Göttingen 1921; in: Die Schriften des Alten Testaments in Auswahl), pp. 103—106, 131. On the last-mentioned page Volz points out that the profession of the wise man sometimes passed from father to son. On the wise man also see P. Volz, Die biblischen Altertümer (Calw-Stuttgart 1914), pp. 192, 215 ff., 341, 351, 356, 366, 420, 437, 483.

[6]) Cf. H. Gressmann, Die neugefundene Lehre des Amen-em-ope und die vorexilische Spruchdichtung Israels (ZAW 1924, pp. 272—296; see especially pp. 292—296); B. Gemser, De Spreuken van Salomo I (Groningen-Den Haag 1929; in Tekst en Uitleg), pp. 15—20; B. Gemser, Sprüche Salomos (Tübingen 1937; in: Handbuch zum Alten Testament), pp. 1—3; P. Humbert in RGG², V (Tübingen 1931), Sp. 1806; J. Meinhold, Einführung in das Alte Testament³, (Giessen 1932), p. 321; W. Baumgartner, Israelitische und Altorientalische Weisheit (Tübingen 1933), pp. 92—94; O. Eissfeldt, Einleitung in das Alte Testament (Tübingen 1934), p. 10; Th. C. Vriezen, Oud-Israëlietische Geschriften (Den Haag 1948), pp. 212—215; J. H. Kroeze, Paraphrase van het boek Spreuken (Franeker 1949), pp. 15, 16; V. Hamp, Das Buch der Sprüche (Würzburg 1949, in: Echter Bibel), p. 6; J. van der Ploeg O.P., Spreuken (Roermond en Maaseik 1952), pp. 7—9; see the articles in Wisdom in Israel and in the Ancient Near East (Leiden 1955; Supplements to Vetus Testamentum III): P. A. H. de Boer, The Counsellor (pp. 42—72); J. Lindblom, Wisdom in the Old Testament Prophets (pp. 192—204); R. B. Y. Scott, Solomon and the beginnings of wisdom in Israel (pp. 262—279). In the same volume Mowinckel will not hear of a too sharp distinction of the various "classes" of the intelligentsia in ancient Israel. "Scholars have often distinguished too sharply between the different "classes" of the "intelligentsia" in ancient Israel: priests, prophets, scribes, wise men, etc. as if they really were sharply defined social and functional "classes". The borders between them were, however, rather fluctuating" (op. cit., p. 206; cf. S. Mowinckel, Psalms and Wisdom in op. cit. pp. 205—224).

[7]) Th. C. Vriezen, op. cit. p. 214.

The Hebrew words chākām and chokmā do not help us much in finding an answer to the question asked by us. Chākām is an adjective and is used as such in the Old Testament. But why should it be impossible for the chākāmīm to form a seperate class? Nor does the meaning decide the question at issue. The stem chkm probably means: to be firm, strong: to be reliable, capable, wise. Chokmā is used of technical skill (Ex. 28 : 3; 31 : 3, 6; 35 : 26, 31; 36 : 1, 2; I Kings 7 : 14; Isa. 40 : 20); of experience so that one is able to choose the right means to attain one's ends (II Sam. 20 : 22; I Kings 2 : 6; 3 : 28; Isa. 10 : 13); it should be borne in mind that also in these two cases it is a gift of God (see e. g. Ex. 28 : 3; I Kings 3 : 28 and others). In Israel wisdom is not only seen as a gift bestowed by God, but also as one of His qualities (Ps. 104 : 24; Prov. 3 : 19; Jer. 10 : 12; 51 : 15). As such this chokmā is even personified (Job 28; Prov. 8). If it can be said that people who are ,,wise", posses the art of living, the Old Testament declares that true wisdom is the fruit of the fear, the awe of Jahve (Prov. 1 : 7; Ps. 111 : 10). Distinct from the wise are the foolish, the ᵓĕwīlīm, the stupid people, who despise wisdom and instruction (Prov. 1 : 7), the kĕsīlīm, the simple ones, the fools who hate knowledge (Prov. 1 : 22). There are also nĕbālīm, "low" types, very wicked sinners [9]). There are also pĕtājīm, inexperienced, naive persons, who are easily led astray, and are easily influenced, for good or evil (Prov. 1 : 4, 22). The book of Proverbs serves "to give prudence to the simple, to the young man knowledge and discretion" (Prov. 1 : 4). The means preferably resorted to by the wise men in Israel, are the māšāl (proverb) and the chīdā (the riddle) (Prov. 1 : 6) [10]). Köhler seeks the origin of the Proverbs in the circle of men sitting together in the evening. One man says something, and then another completes his statement. Thus one man may say: "A whip for the horse, a bridle for the ass"; and another finishes with: "and a rod for the fool's back" (Prov. 26 : 3). The proverbs then have their origin in conversation [11]). We can fully agree with Köhler that the wisdom of the people, which make proverbs, also manifests itself in the Old Testament. As an example I take what we are told about Saul, three times over. The expression runs: "Is Saul also among the prophets? "The people who saw him behaving like a prophet, or going into a state of ecstasy, said this to one another. But it also says "and it became a māšāl " (I Sam. 10 : 11, 12; 19 : 24 [12]). It is quite possible that the wise men have taken over such proverbs and that also the book of the Proverbs contains them, but on the other hand we can adduce not only books like Job and Ecclesiastes, but also the Proverbs to prove that in the main Köhler's thesis is incorrect. It is not for nothing that names like those of Solomon and of others are associated with the proverbs. They are a special form of art. The wise man in Israel is not the Israelite, be it the old and experienced Israelite, without any more.

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[8]) S. Yeivin, Social, religious and cultural trends in Jerusalem under the Davidic dynasty (V. T. 1953, pp. 149—166), pp. 149, 150. Oesterley in his The Book of Proverbs (London 1929; Westminster Commentaries) refers to II Sam. 1 : 18; Joshua 15 : 15 as places suggesting "a centre of some kind in which the scribal art was pursued and in which instruction would be given" (op. cit. p. LXIX).

[9]) Cf. W. H. Gispen, De stam nbl (G.T.T. 1955, pp. 161—170).

[10]) See on the māšāl the article by A. R. Johnson in the collection mentioned in note 6: Wisdom in Israel and in the Ancient Near East (Leiden 1955), pp. 162—169. The chīdā was very popular; cf. Judges 14 : 12—19; I Kings 10 : 1; II Chron. 9 : 1.

This does not answer the question, however, whether we can speak of a special class of wise men.

To answer this question we shall have to examine the relevant places in the Old Testament. But we shall have to bear in mind that wisdom in the ancient East was an international phenomenon. The Old Testament iself states this clearly, and the excavations of the last century have strikingly confirmed it. Particularly for the chokmā they have furnished abundant material. The wisdom of Israel cannot be imagined any longer without the framework which makes it more intelligible [13]). But if in countries outside Canaan a special class of wise men were found, this international character of the chokmā justifies us to attach more importance to it, even if the Old Testament should be silent about such a class. It would be a quite different matter, of course, if the Bible stated emphatically that Israel did not know such a class or was not permitted to have one. The semasiological use of the words chākām and chokmā has something to say here. Should the word chākām denote an Egyptian magician, it would be difficult, if these magicians formed a seperate class in Egypt, to conclude from this that such a class of magicians will also have existed in Israel. The concept of wisdom is determined by religion. And Israel's religion forbids sorcery. Hence it is that Ex. 7 : 11, 12 actually does not say anything about the wise men in Israel, for it says there: "Then Pharaoh also called the wise men and the sorcerers; and they also, the magicians of Egypt, did in like manner with their secret arts. For they cast down every man his rod, and they became serpents; but Aaron's rod swallowed up their rods." Moreover, even apart from what we find among other nations, we must not lose sight of the fact that chākām and chokmā may have an unfavourable connotation. Cf. the Dutch word "goochem". Jonadab, the friend of Amnon, who gives Amnon the advice to sham illness and to ask his father if his sister Tamar may wait on him, is called "a very subtile man" (II Sam. 13:3). The new Dutch translation reads "a very shrewd man"[14]). And here, too, we do not think first of all of a special group. Other designations are used as well, e. g. that of "sinners" (Proverbs 1 : 10). We should remember, of course, that it says in Job 5 : 13 that God takes the wise in their own craftiness. This statement is quoted by St. Paul in I Cor. 3 : 19 in order to explain his words: "For the wisdom of this world is foolishness with God".

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[11]) Ludwig Köhler, Der hebräische Mensch (Tübingen 1953), pp. 91—94.

[12]) For more instances of folk wisdom see R. H. Pfeiffer, Introduction to the Old Testament (NewYork - London 1941), pp. 37, 38.

[13]) Cf. W. Baumgartner, Israelitische und Altorientalische Weisheit, pp. 19 and 23.

Full stress is laid in the Old Testament on the international character of the chokmā. It mentions Egypt (Gen. 41 : 8; Ex. 7 : 11, 12; I Kings 5 : 10 = A. V. 4 : 30; Isa. 19 : 11, 12); Edom (Jer. 49 : 7; Ob. : 8); Arabia (Prov. 30 : 1; 31 : 1; the Queen of Sheba); Phoenicia (Ez. 27 : 8, 9; 28 : 4—7, 12, 17; Zach. 9 : 2); „the East" in general (I Kings 5 : 10 = A. V. 4 : 30), by which will be meant Arabia and Edom; Babel (Isa. 47 : 10; Jer. 50 : 35; 51 : 57; Dan. 1 : 20; 2 : 2, 10, 12, 13, 14, 18, 24, 27, 48; 4 : 3, 15 = A. V. 4 : 6, 18; 5 : 7, 8, 11, 15); Persia (Esther 1 : 13; 6 : 13) and speaks about the wise men of the nations (Jer. 10 : 7).

The Old Testament knows about the centuries old wisdom of Egypt. It is, therefore, a devastating criticism passed upon them when Isaiah in the name of Jahve says: "The princes of Zoan are utterly foolish (ᵓĕwīlīm), the wisest counsellors of Pharaoh — a stupid council. How can you say to Pharaoh: I am a wise man, the son of ancient kings? Where are they then, thy wise men? Let them tell thee now, that it be known what Jahve hath purposed concerning Egypt? (Isa. 19 : 11, 12) [15]). The wise are here the counsellors of the king, just as David had Husai and Achitofel as counsellors (II Sam. 15 : 12, 32—37; 16 : 15—23; 17 : 1—23)[16]. That wisdom should be attributed especially to kings is quite natural in the Ancient East. Think of what the wise woman of Tekoah says to David: "My lord is wise according to the wisdom of an angel of God, to know all things are in the earth" (II Sam. 14 : 20). Here, too, there is the idea that wisdom comes from above, just as we also, read of Ahitophel that his counsel was weighty as if a man had asked a word of God[17]. Babylonian as well as Assyrian kings boast in their inscriptions of their wisdom[18].

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[14]) Cf. M. Noth, Die Bewährung von Salomos "göttlicher Weisheit" in the collection mentioned in note 6: Wisdom in Israel and in the Ancient Near East (Leiden 1955), pp. 225—237; see p. 233. Cf. Job 37 : 24.

[15]) In Gen. 41 : 8 the wise men may denote counsellors of Pharaoh; they may also be fortune tellers. Then it would be a case similar to that of Ex. 7 : 11 and 12.

To revert, however, to the wisdom of Egypt — it is significant that we read of the wisdom of Solomon that it excelled the wisdom of all the children of the East, and all the wisdom of Egypt (I Kings 5 : 10; A. V. 4 : 30).

However tempting it would be to dwell at length on Solomon and to pay full attention to the hypothesis launched by Alt, that Solomon in his proverbs and songs altogether changed the character of the "Listenwissenschaft", the dry enumerations of all kinds of curious information in lists of encyclopedic content, and that this was his share in the international competition in the field of wisdom, we have to confine ourselves to our subject[19]. And then we observe that king Solomon was wise, but not a wise man by profession. We must, however, pay due attention to Eissfeldt's true observation in connexion with these statements about Solomon that the desire for real knowledge is not entirely wanting in the Old Testament[20]. Particularly in Solomon we see that wisdom is clearly a gift of Jahve and it enables him to take the right decisions in administering justice (cf. I Kings 3). No wonder that his name should be associated with the book of the Proverbs, even if not all the proverbs in it are by him, but only two collections (10 : 1—22 : 16 and 25 : 1—29 : 27)[21]. When he is called wiser than Ethan the Ezrahite and Heman and Chalcol and Darda, the sons of Mahol (I Kings 5 : 11 = A. V. 4 : 31), we unfortunately know too little of these men to say with any certainty that they were wise men by profession [22]). The Queen of Sheba, who came to "prove" Solomon with riddles (chīdōt) (I Kings 10 : 1), sees him as the wise king and admires this wisdom also in his regal splendour (I Kings 10 : 4).

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[16] Cf. P. A. H. de Boer, The Counsellor in the book mentioned in note 6.

[17] Cf. N. W. Porteous, Royal Wisdom, p. 248 in the collection mentioned in note 6, pp. 247—261.

[18] Cf. e. g. Sanherib Taylorprisma I 4; Codex Hammurabi IV 7.

[19] Cf. A. Alt, Die Weisheit Salomos (Theologische Literaturzeitung 76, 1951, pp. 139—144 = Kleine Schriften zur Geschichte des Volkes Israel II, München 1953, pp. 90—99). About an Egyptian list enumerating all this curious information see also A. Erman, Die Literatur der Aegypter, Leipzig 1923, pages 239—241.

[20] O. Eissfeldt Religionshistorie und Religionspolemik, p. 94 (article in the collection mentioned in note 6: pp. 94—102).

[21] Cf. KV Spreuken I (Kampen 1952), Introduction § 2.

In the Old Testament no communications are found about the schools for scribes existing in Egypt, in which various books of instruction were used [23]). The pupils had to copy out such writings on wisdom. Probably there were two departments: the one served for elementary instruction, the other for pupils wo had already been appointed as official or "scribe" and had to copy longer documents under the supervision of an older official. The third part of the book of the Proverbs (chapters 22 : 17—24 : 22) shows points of close agreement with the instruction of Amen-Em Ope [24]). This part is called "the words of the wise" (Prov. 22 : 17). One might suppose that those wise men or one of them visited Egypt and either at such a school for scribes or as interested travellers became acquainted with the instruction of Amen-Em-Ope. That this should have taken place at such a school for "scribes" is most unlikely, since they were destined for the training of Egyptian officials. Such a school was more suitable for Moses, who according to Stephen was instructed in all the wisdom of the Egyptians (Acts 7 : 22). Nor do we know anything of a journey of Israelites to Egypt to acquire wisdom there. A more likely supposition is that Israel, too, had schools for scribes or officials in the days of the kings and that everywhere in the Ancient Near East special books on wisdom were used at these schools. The possibility of a common example for Amen-Em-Ope and for the "wise men" in Prov. 22 : 17—24 : 22 is not excluded [25]).

In Psalm 105 : 22 we read a remarkable statement about Joseph, namely that he taught wisdom to Pharaoh's elders (better perhaps: made them wise). Such a poetic saying should not be unduly stretched.

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[22]) Van Gelderen in KV Kings I a. 1. thinks of Judaeans; Montgomery of Arabs; cf. J. A. Montgomery, Arabia and the Bible (Philadelphia 1934), pp. 169 ff. and J. A. Montgomery and H. S. Gehman, The books of Kings (ICC, Edinburgh 1951), p. 130.

[23]) See A. Erman, Die Literatur der Aegypter (Leipzig 1923), p. 86; pp. 238—242; cf. also KV Spreuken I (Kampen 1952), Introduction § 4.

[24]) Cf. W. D. van Wijngaarden, Het boek der wijsheid van Amen-Em-Ope, den zoon van Kanecht (Santpoort 1930); G. Ch. Aalders, Bijbelse Spreuken en de onderwijzing van Amen-Em-Ope (Assen 1934); KV Spreuken I and II (Kampen 1952 and 1954) passim.

[25]) Cf. KV on Prov. 22 : 17; 23 : 4. On the possibility of schools in Israel in the times of the kings see ante and note 8.

It will not mean more than that even Pharaoh's elders could learn much from Joseph. Joseph was a regent, not a teacher of wisdom. Nor can we agree with Von Rad, who on the strength of a few places in the book of the Proverbs has tried to show that in the story of Joseph we have to deal with a story of a chokmatic character, in which Joseph is the example of the ideal wise man 26). We must be on our guard not to extend the range and sphere of application of the chokmā too much, as Pfeiffer does in his introduction to the Old Testament 27), in which book large portions of the Pentateuch have a place assigned to them under "wisdom".

In the Old Testament wisdom and wise men are also attributed to Edom. The prophet Jeremiah is told to ask on behalf of Jahve Sebaōt: "Is wisdom no more in Teman, is counsel perished from the prudent? Is their wisdom vanished?" (Jer. 49 : 7). And in Obadiah we hear the question: "Shall I not in that day, saith the Lord, destroy the wise men out of Edom, and understanding out of the mount of Esau?" (verse 8). Here, too, the question whether the wise men formed a separate class is not easy to answer. We do get the impression that they are on a par with wise counsellors. In the book of Job we find among Job's friends Eliphaz, the Temanite. He was, therefore, an Edomite. But we do not gather the impression, no more than we do in the case of Job himself, that he was a "wise man" without any more. Job himself was a rich live-stock farmer (Job 1 : 3), and was one of the judges in the gate of the city (Job 29 : 7—25). Eliphaz himself speaks about something that the wise men tell on the authority of their fathers which they do not hide "when to them alone the land was given and no stranger was in their midst" (Job 15 : 18, 19). This implies that afterwards in the country (Edom) tradition, also the chokmā, was corrupted by foreign influences 29). That we are to understand by this Egyptian and other influences is not certain, but is very likely. We do not know exactly where the land of Uz, where Job lived, lay. (Job 1 : 1). Van Gelderen thinks of Aram. Others think of Edom.

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26) G. von Rad, Josephsgeschichte und ältere Chokma (Supplements to Vetus Testamentum I Congress Volume Copenhagen; Leiden 1953, pp. 120—127). H. H. Rowley is critical of Von Rad's view, cf. VT III (1953), p. 424. See on Ps. 105 : 22 B. Gemser in: Tekst en Uitleg, De Psalmen III (Groningen - Batavia 1949), p. 119. On Joseph as counsellor and as the father to Pharaoh (Gen. 45 : 8), De Boer, op. cit. p. 57.

27) New York - London 1941, pp. 34—40.

28) Cf. C. van Gelderen, De hoofdpunten der zielsgeschiedenis van Job (Kampen 1905), pp. 10, 11.

29) Cf. W. H. Gispen, Mondelinge overlevering in het Oude Testament (Meppel 1932), pp. 89—92.

Pfeiffer considers the book of Job a product of Edomitic wisdom [30]). He assumes in Genesis a source S (from South of Seir) [31]). This looks to be an exaggeration of Edomitic influence on the formation of the Old Testament. Moreover, as regards the book of Job a difference will have to be made between the place of residence of the principal person and that of the writer of the book. That the latter was not an Israelite, is improbable. It would, however, not be correct to use the word "impossible" in this connexion, since Arabic wise men are allowed to speak in the book of Proverbs.

The wisdom of Solomon excelled the wisdom of all the children of the East (I Kings 5 : 10 = A. V. 4 : 30). The sixth part of the book of the Proverbs (chapter 30) contains the words of such a man of the East, Agur, the son of Jakeh, and Proverbs 31 : 1—9 the words of Lemuel (cf. Prov. 30 : 1). It is possible that Agur was a wise man by profession, but we cannot prove this. In all probability he was of Arab descent. It may be assumed that he lived in the time of king Hezekiah. But although he was probably a non-Israelite, of Arab descent, yet he knew and worshipped the God of Israel [32]). In Proverbs 31 : 1—9 have been preserved "the words of Lemuel, king. The prophecy that his mother taught him" (Cf. 31 : 1). We do not know who this king Lemuel was. But in this case, too, Arab origin is not improbable [33]).

Phoenicia, too, has its wise men and its wisdom, as the Old Testament tells us. In Ezekiel 27 and 28 we find some data. Mention is made there of wise men of Tyrus and of Gebal or Byblos (Ez. 27 : 8, 9). The king of Tyrus is addressed there with the words: "Behold, thou art wiser than Daniel" and "full thou art of wisdom" (Ezek. 28 : 4—7, 12, 17). But in this case, too, it is not clear whether Phoenicia knew wise men by profession. And we have already seen that wisdom is particularly attributed to kings. But the king of Tyrus did not see this wisdom, which should be rooted in the fear of God, as a gift of God, and therefore it will vanish (Ezek. 28 : 17). Even if the Daniel mentioned in Ezek. 14 : 14, 20 and 28 : 3 should be the legendary Danᵓel from the Ugaritic texts, he is not a professional wise man here, as he appears as a judge[34]). Zechariah 9 : 2 also refers in general terms to the wisdom of Tyrus and Sidon.

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[30]) R. H. Pfeiffer, Edomitic Wisdom (ZAW 1926, pp. 13—25).

[31]) R. H. Pfeiffer, A Non-Israelitic source of the Book of Genesis (ZAW 1930, pp. 66—73); id., Introduction, pp. 159—167.

[32]) See on Agur KV Spreuken II on Prov. 30 : 1.

[33]) See on Lemuel KV Spreuken on Prov. 31 : 1.

The excavations of Ugarit have shown us how great the influence is exercised by the Canaanite-Phoenician culture on Israel. And this also applies to the books of wisdom in the Old Testament, particularly that of the Proverbs. That is also the reason why greater value is again attached to the statements in this book about the authorship of Solomon (cf. 1 : 1; 10 : 1; 25 : 1). Ugaritic shows great likeness to Hebrew. There are also points of agreement in style. The so-called "numerical proverbs" (e.g. Prov. 6 : 16: "These six things doth the Lord hate: yea, seven are an abomination unto him") are also met with in Ugaritic texts. But Ugaritic gives us no solution either for the problem occupying us now[35]).

As to Babel, it strikes us that the wise men of that country mentioned in the Old Testament, only appear on the scene at a late date. Isaiah, Jeremiah and Daniel refer to the new-Chaldean empire of Nebuchadnezzar. Isaiah indeed, announced the fall of the king of Assur because, alluding to his extinction of so many nations, he said: "By the stength of my hand I have done it, and by my wisdom; for I am prudent" (Is. 10 : 13). But it is only Nebuchadnezzar and Belshazzar who are surrounded in the book of Daniel by their wise men as counsellors, into whose circle Daniel and his friends are received, of whom especially Daniel can "give interpretations and solve doubts" (Daniel 5 : 16).

Against Babylon, too, God's judgement is foretold by Isaiah, because its wisdom and knowledge have perverted it and brought it to arrogance and pride (Isa. 47 : 10). Its culture was the cause of its hybris. And through Jeremiah Jahve pronounces His judgement against "its wise men" (Jer. 50 : 35; 51 : 57). These counsellors of the king no doubt worked with such means as astrology and liver-gazing (Dan. 1 : 20; 2 : 2, 12, 14, 18, 24, 27, 48; 4 : 3, 15 = A. V. 4 : 6, 18, compared with 4 : 4, 6 = A. V. 4 : 7, 9; 5 : 7, 8, 11, 15). Now the remarkable fact presents itself that Daniel was appointed head of this council of wise men by Nebuchadnezzar and that he sees wisdom as a gift of his God who reveals secrets (cf. e. g. Dan. 2 : 28). For Daniel the accent lies on the chokmā in the sense in which it is again and again found in the Old Testament. And there is the possibility that we also have to reckon with his influence when centuries later the wise men from the East come to worship the new-born king of the Jews, because they have seen his star in the East (Matth. 2 : 1, 20 [36]).

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[34]) See on the question whether the Daniel of Ezekiël 14 : 14, 20; 28 : 3 is to be identified with Dan'el of the Ugaritic texts: J. H. Kroeze, De betekenis van de opgravingen te Ras Sjamra (G.T.T. 1940, pp. 64—80), pp. 75—78; A. Noordtzij and G. Ch. Aalders on Ezek. 14 : 14, in the KV and in the Commentary on the Old Testament respectively. Noordtzij and Kroeze favour the identification, Aalders is against it. The possibility of the former being right, is great in my opinion.

[35]) Cf. Cullen I. K. Story, The Book of Proverbs and Northwest Semitic literature (JBL LXIV 1945, pp. 319—337); W. F. Albright, Some Canaanite-Phoenician Sources of Hebrew wisdom in the volume mentioned in note 6, pp. 1—15.

There is no doubt some likeness between Joseph in Egypt and Daniel in Babylon. Both are called to high posts in the government of the country of their captivity after having interpreted a dream of the king which none of his wise men was able to explain. And like Egypt we should also wrong Babylon if we thought that, because the Old Testament is silent about it, no wisdom was practised there distinct from sorcery and fortune-telling. The culture of the nations in Mesopotamia undoubtedly does know this pursuit of wisdom.

There are Sumerian and Accadian proverbs and admonitions; and the Aramaic proverbs preserved in "The words of Ahiqar" take us to the court of the Assyrian kings Sanherib and Esarhaddon [37]). Sumer had its school, the Edubba, and among the exercises which had to be done by the pupils there are also extracts from texts of wisdom, especially proverbs. This school was independent of the priests and the temple. The texts of the Edubba show that the teacher thought himself far superior to his pupil, even said to him: "I am more 'man' than thou" [38]). Owing to the complicated character of the cuneiform writing the scribe occupied a highly honoured position; the Assyrians and Babylonians were fond of riddles [39]). We should not have too low an opinion of education in ancient Mesopotamia. Mathematics was at a very high level. The huge library of king Assurbanipal, in which many works of literature have been preserved, affords evidence of this culture [40]).

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[36]) Cf. F. W. Grosheide, Mattheus^2 (Commentary; Kampen 1954) on Matth. 2 : 2; also Herman Ridderbos, Mattheus^2 (KV; Kampen 1952) on the same verse.

[37]) Cf. KV Spreuken I (Kampen 1952), Introduction § 4; II (Kampen 1954) § 8.

[38]) J. J. A. van Dijk, La Sagesse suméro-accadienne (Leiden 1953), pp. 21—27; see on Sumerian wisdom also H. Schmökel, Das Land Sumer (Stuttgart 1955), pp. 117, 118. F. M. Th. de Liagre Böhl wrote me that it is possible that the form of the Edubba-texts may have had its influence on the Proverbs of the Old Testament.

[39]) G. Contenau, La vie quotidienne à Babylone et en Assyrie^{16} (Paris 1950), pp. 175—185.

[40]) Cf. F. Thureau-Dangin, Textes mathématiques babyloniens transcrits et traduits (Leiden 1938); G. Conteneau, La civilisation d'Assur et de Babylone (Paris 1951); M. A. Beek, Aan Babylons stromen (Amsterdam - Antwerpen 1950). The choice of these works iis more or less arbitrary, to support our statements in the text. They may serve for general information.

In the book of Esther we read that the Persian king Ahasveros, and also Haman, a high-placed prince at the court of that king, have "wise men" as a council of advice (Esther 1 : 13; 6 : 13). It is probable that they worked with astrology and magic[41]). The Persian king Arthasasta attributed wisdom to the scribe Ezra, who returned from Persia to Canaan (Ezra 7 : 25)[42]).

Our conclusion then is that Israel with its wise men and its pursuit of wisdom does not occupy a position which is unique in this respect, but that it shares this position with the nations of the Near East. The chokmā literature is international. The wise man in Israel, who knew and used much of this literature, and who even permitted non-Israelite wise men to speak in the books of wisdom of the Old Testament, was a man of broad views, of human ambitions and ideals, a master of the art of living. The particular revelation of Scripture has absorbed this chokmā and has given it its own Israelite character in the fear and awe of Jahve (cf. Prov. 1 : 7 and 31 : 30).

All this is no answer yet to the question asked at the beginning: Did the wise men in Israel form a seperate rank or class? The wise men in the Near East outside Canaan were professionally something else. In so far we should be inclined to answer the question in the negative.

The Old Testament, however, furnishes some data, which it is necessary to discuss before we can arrive at a definitive answer to the question.

When it is said of Joshua that he was full of the spirit of wisdom, because Moses had laid his hands upon him (Deut. 34 : 9), this may serve as an explanation of the fact that the Israelites listened to him; he was the captain and leader of Israel in conquering the promised land, but certainly not just a wise man and nothing else.

The wise woman of Tekoah, who was summoned by Joab to induce David to let Absalom return to the court (II Sam. 14 : 1—20), no doubt enjoyed a reputation of being a shrewd woman[43]). Chākām is used in the same meaning here as we found it in II Samuel 13 : 3, in connexion with Jonadab, the friend of Ammon, although the new Dutch translation speaks of "a wise woman" here.

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[41]) Cf. G. Ch. Aalders in KV on Esther 1 : 13; J. Schelhaas Hzn in: Het Oude Testament van verklarende aantekeningen voorzien I (Kampen 1952) on Esther 1 : 13; 6 : 13; G. Smit in Tekst en Uitleg Ruth, Ester en Klaagliederen (Groningen - Den Haag 1930); C. F. Keil in: Biblischer Commentar über die nachexilischen Geschichtsbücher: Chronik, Esra, Nehemia und Esther (Leipzig 1870). On Persian culture see R. Ghirsman, Iran (in the Pelican Archeology Series 1954). On Persian wisdom in later times see W. B. Hemming, Eine Arabische Version mittelpersischer Weisheitsschriften (ZMDG 1956, pp. 73—77). On the elimination of the typically Persian character of these translations see p. 76.

[42]) Cf. also H. H. Grosheide, Ezra, de schriftgeleerde (G.T.T. 1956, pp. 84—88).

[43]) Cf. on her W. Caspari, Die Samuelbücher (Leipzig 1926; in: E. Sellin,

There lived such a woman in Abel — Beth — Maächa, which place she herself called "a mother in Israel". For according to her, people were wont to speak in olden times saying: Go and ask counsel at Abel; and so they ended the matter (II Sam. 20 : 16—19[44]). When Joab asks her to deliver Sheba, the rebel, to him, she promises Joab that his head will be thrown to him over the wall. Then the woman went unto all the people in her wisdom; and they cut off the head of Sheba, the son of Bichri, and threw it out to Joab (II Sam. 20 : 21, 22)[45]). "Shrewd" ladies of the mother of Sisera, the general of the Canaanites, are mentioned in the Song of Deborah (Judges 5 : 29). In Jeremiah 9 : 16 (A. V. 9 : 17) the "cunning" women are, as the context shows, wailing-women[46]). There were, however, in Israel, also wise women in the ordinary sense of the word. The competent, energetic woman in Prov. 31 : 10—31 is one of them (cf. Prov. 31 : 26).

When in the book of Isaiah Jahve fortetells Judah that "the wisdom of its wise men shall perish, and the understanding of its prudent men shall be hid", (Isa. 29 : 14), this need not refer to a separate, distinct class of wise men; it may point to the leaders of the people. And this may also be the case in Isaiah 44 : 25, where Jahve says of Himself: "That frustrateth the tokens of the false prophets, and exposeth diviners for fools; that turneth wise men backward, and maketh their knowledge foolish". Here the reference may be to heathen fortune tellers and astrologers[47]).

Who are the people referred to in Jeremiah 8 : 8, 9, when Jeremiah is ordered to ask the people of Judah in the name of Jahve: "How

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Kommentar zum Alten Testament), pp. 553, 567. Caspari translates in verse 2: „eine gewandte Frau". Joh. de Groot in Tekst en Uitleg II Samuel (Groningen - Batavia 1935), p. 32 translates: "a shrewd woman". On p. 112 he uses the words "cunning and glibness of tongue".

[44]) Cf. P. A. H. de Boer, op. cit. p. 60.

[45]) Cf. Caspari and De Groot op. cit. The former, however, wrongly thinks of a centre of worship in order to explain the words "a mother in Israël"; the latter erroneously of a mother city (p. 132).

[46]) Cornill, Volz and others leave the possibility open that the chăkāmōt also pursued other activities e. g. fortune-telling. See C. H. Cornill, Das Buch Jeremia (Leipzig 1905) and P. Volz, Der Prophet Jeremia^2 (Leipzig 1928; in: E. Sellin, Kommentar zum Alten Testament) a. l.

[47]) Cf. Franz Delitzsch, Commentar über das Buch Jesaja^4 (Leipzig 1889); A. Dillmann—R. Kittel^6 (Leipzig 1898); J. Ridderbos, KV Jesaja II (Kampen 1926) a. l.

dare you say: We are wise and the tōrā of Jahve is with us? Certainly, behold, the false pen of the scribes hath made it falsely! The wise men have been put to shame, they are dismayed and ensnared! Lo, the word of Jahve they have rejected, what manner of wisdom would be in them then?" Are the scribes identified here with the wise and are we to understand by the tōrā of Jahve the book of Deuteronomy, as some say?[48]). Others think that the reference is to the false prophets[49]). The opinion has also been advanced that by the scribes and the wise men are meant officials, lawyers, religious teachers[50]). Things being so, we certainly have no clear statement here giving an answer to the question that concerns us now. Nor is this the case with Jeremiah 9 : 11, 22 (= A. V. 9 : 12, 23), where "the wise men" and "the wise" are only referred to in general. In Jeremiah 18 : 18 it says of Jeremiah's adversaries: "Then said they: Come, and let us devise devices against Jeremiah; for the priest is never without instruction, or the wise man without counsel or the people without a word! Come, let us smite him with the tongue, and let us not give heed to any of his words"[51]). This place might give us the impression that "the wise man" formed a separate category, by the side of "the priest" and "the prophet". But Ezek. 7 : 26 contains the threat: "They shall desire a vision from the priest, the priest will be without instruction and the ancients without counsel". So the ancients here take the place of the "wise men", which term will consequently have to be a name for a leader in general, and in this case a political leader. And so we come at last to the books of wisdom, particularly that of the Proverbs. Here, too, we shall have to make a distinction. There are a good many places speaking about "the wise man" and "the wise", which do not help us any further. Nor does an instance such as we find in Ecclesiastes 9 : 15 dealing with "a poor, wise man, who had been able to deliver the city by his wisdom", shed any light upon the question at issue. There are, on the other hand, also places in which it is quite natural to think of a group of wise men. The following places may be quoted from the book of the Proverbs. "That the wise man may hear, and increase in learning; and that the man of understanding may attain unto sound counsels; to understand a proverb, and the interpretation; words of the wise, and their riddles" (Prov. 1 : 5, 6). "The teaching of the wise is a fountain of life, to depart from the snares of death" (Prov. 13 : 14). The scorner loveth not to be reproved: he will not go unto the wise (Prov. 15 : 12). "The ear that heareth the reproof of life abideth among the wise" (Prov. 15 : 31). "Scornful men set a city in flame, but wise men turn away wrath" (Prov. 29 : 8).

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[48]) Cf. J. Lindblom, op. cit., pp. 195, 196; in this he follows Rudolph. We might also mention Cornill and others.

[49]) G. Ch. Aalders and A. de Bondt. The latter in: Het Oude Testament van verklarende aantekeningen voorzien, II (Kampen 1954).

[50]) e. g. Volz.

[51]) Here, as in a few other places, we use the new Dutch translation.

These pronouncements, too, furnish no proof that there was in Israel a seperate class of wise men. But something more can be said.

It is well-known that the wise man who is introduced to us in the book of Proverbs, addresses his pupil, also the reader of this book, as: "My son" [52]). Moreover, we have headings in the Proverbs where "the wise" are mentioned. This is the case in Proverbs 22 : 17, where we raid: „incline thine ear and hear the words of the wise" [53]). Proverbs 24 : 23a is the heading of a small collection reading: "These are also by the sages" [54]). And there are two places in Ecclesiastes. The first is reading: "The words of the wise heard in quiet are better than the cry of him that ruleth among fools" (Eccles. 9 : 17); and the second: "The words of the wise are as goads; as nails well-fastened are the collections of them; they have been given by one shepherd" (Eccles. 12 : 11) [55]).

Combining what has been said above, we are left with the impression that in Israel the wise man gradually appeared as a teacher of young people, as a writer and as a collector of proverbs. Proverbs 25 furnishes a very valuable datum. It is again a heading, a superscription to Proverbs 25 : 1—29 : 27, which part is introduced as follows: „These are also proverbs of Solomon, which the men of Hezekiah, the king of Judah „took over". By "the men of Hezekiah" we are to understand a committee which was instructed by king Hezekiah to "take over" i. e. to copy out the Proverbs of Solomon or part of them [56]). As in 722 B. C. the kingdom of the ten tribes had come to an end, it is understandable that Hezekiah, the king of Judah, who was a god-fearing king, did his utmost to preserve the religious literature of Judah for posterity. According to the Jewish tradition Hezekiah and his men were the editors of the books of Isaiah. Proverbs, the Song of Songs and Ecclesiastes. There is no foundation for the opinion that the Proverbs of

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[52]) See Proverbs 1 : 6 and the places mentioned in the KV when discussing this verse.

[53]) See KV on this verse.

[54]) See KV on this verse.

[55]) Cf. G. Ch. Aalders, Het Boek de Prediker (Kampen 1948; in: Commentaar op het Oude Testament) on Eccles. 9 : 17 and 12 : 11.

[56]) See on the Hebrew verb used here KV Spreuken II on Prov. 25 : 1.

Prov. 25 : 1—29 : 27 originated from the kingdom of the ten tribes and were saved by the men of Hezekiah. Apart from the fall of that kingdom, the time of Hezekiah is likely to have been a flourishing period in religion and literature, especially when the invasion of Sennacherib (701 B. C.) was repulsed. Mention must be made here of the influence of Isaiah and his circle. There is no conclusive evidence that Shebna the Scribe played a part among these "men of Hezekiah" 57). It is probable that the whole book of the Proverbs was brought into its present form in the days of the king Hezekiah. In that time the various collections of which it consists were joined together 58).

We see, therefore, that especially in the days of Hezekiah and after, the wise man in Israel appears to be the man who both in the field of juvenile education and in his literary activities applies himself to formulating and handing on the chokmā, i. e. practical advice for everyday life. Although there is much latitude of opinion, he took his starting-point in the fear and the awe of Jahve. It is possible, although it cannot be proved, that since the time of Hezekiah he made a special profession of these activities. It is likewise possible that in that time schools arose of these god-fearing wise men in addition to the schools for "scribes" or for officials which had been in existence for some time. In the long run, especially in and after the Babylonian captivity the religious devotion which characterized the wise man in Israel, and which is also shown by his adhering closely to the Torā, the Pentateuch, made him a scribe 59). Thus the internationally orientated wise man gradually came to be the Jewish rabbi. But also the latter often pursued an ordinary trade or profession along with it. At a later date Judaism placed the chokmā on a par with the Tōrā 60). The appendix of Pirqē Abōt, which was not embodied in the Mišna, but did find a place in the Jewish prayer-books, begins as follows: "the wise men

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57) For this supposition see R. B. Y. Scott, op. cit. pp. 276, 278, 279. Cf. about "the men of Hezekiah" pp. 273—279. Scott translates: "which the men of Hezekiah *brought forward* (the italics are Scott's; p. 273). See on Shebna, II Kings 18 : 18, 26, 37; 19 : 2; Isa. 22 : 15—25; 36 : 3, 11, 22; 37 : 2. There is no conclusive evidence that the proverb preserved in Prov. 25 : 5 refers to him.

58) Cf. KV Spreuken II, Introduction § 8.

59) See for the connexion between the Proverbs and the Pentateuch, in particular the Decalogue, W. H. Gispen: Israels "verhaaldwang" (Assen 1947), pp. 13—17. See for the significance of the Babylonian captivity for the study of the Law, H. L. Strack, Einleitung in Talmud und Midraš5 (München 1930), p. 5 ff.

60) Cf. Pirqē Abōt VI and KV Spreuken II, Introduction § 8; Strack—Billerbeck, Kommentar zum Neuen Testament aus Talmud und Midrasch II (München 1924), p. 353 ff. Also after the captivity there are special books of wisdom, such as those of Jesus Sirach and Pirqē Abōt. In Pirqē Abōt II, 2 the advice is given to pursue an ordinary profession along with the study of the Tōrā.

taught in the language of the Mišna" [61]). The wise men meant are the rabbis. The parents of Jesus found Him, who had become twelve years of age, "in the temple, sitting in the midst of the teachers, both hearing them and asking them questions" (Luke, 2 : 46). As is especially shown by His teaching in the Sermon on the Mount and in the parables, He was the great wise Teacher, on whom, according to the prophecy of Isaiah, rested "the Spirit of wisdom and understanding" (Isa. 11 : 2). He said: "And wisdom is justified on the strength of her works" (Matth. 11 : 19) [62]).

It is sometimes said that in our days of ever increasing specialised knowledge we stand increasingly in need of wisdom. We, too, have the duty assigned to us to reckon with the searching word of Jesus: "The queen of the South shall rise up in the judgement with this generation, and shall condemn it: for she came from the ends of the earth to hear the wisdom of Solomon; and, behold, more than Solomon is here" (Matth. 12 : 42) [63]).

W. H. GISPEN

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[61]) Cf. Pirqē Abōt VI. 1; H. L. Strack, Pirqē Abōt⁴ (Leipzig 1915), p. 4*. M. Sachs, Sprüche der Väter² (Breslau 1907), translates the above-quoted place: "Auch das Folgende haben die Weisen in der Sprache der Mischnah gelehrt". See for the seven characteristics of the wise man, Pirqē Abōt V, 7: "Seven things are found with the uneducated and seven with the wise man. The wise man 1. does not speak in presence of him who is greater in wisdom than he; 2. he does not interrupt his fellow-student; 3. he does not answer too quickly; 4. he asks in accordance with the rule and answers in agreement with the subject in question; 5. he speaks about the first thing first and last about the last thing; 6. about what he has not heard he says: I have not heard; 7. and he assents to the truth. And the reverse is found with the uneducated."

[62]) What is meant is divine wisdom; cf. F. W. Grosheide, op. cit. and Herman Ridderbos, op. cit. on Matth. 11 : 19.

[63]) Cf. Luke 11 : 31. See on the difference between wisdom and science L. Bender O.P., Kerk en Wetenschap (Het Schild 1953, pp. 129—135). The reader will have noticed that the result I arrived at shows many points of agreement with the views of Volz, Oesterley and others, referred to above. There are, however, great differences as to the dating and also in the position taken up with regard to the Pentateuch, particularly Deuteronomy. In respect of the transition from the wise man to the scribe the following remark of Oesterley's is typical: "It was not until after the Maccabean struggle, when the anti-Hellenistic attitude of the religious leaders became dominant, that there was no place for the Wise men, who consequently became absorbed in the Scribes in the later sense of the term" (op. cit. p. LXXI).

THE SECRET OF THE ADMINISTRATION OF JUSTICE

1. John Johnson had a good position. He was associated with a large concern and he held a considerable place in it. He liked it, too, for every now and then he had to make long journeys by train or aeroplane, in order to report to his chiefs on interesting matters in far countries.

But with all this John Johnson was never at home and Mrs. Johnson began to ask him more and more insistently: When are you going to have some time for *me?* One day they were talking together about it; they had just come to the conclusion that it would be quite a solution if they could have a second-hand motorcar, when an acquaintance of Mrs. Johnson's happened to look in, who said: Oh, my husband just wants to sell his car! Contact was soon made, and not long after the bargain was concluded. At half the price of a new car John Johnson bought an old one and he and his wife were happy.

This happiness was not of long duration, for after about a fortnight the car showed defects so serious that the question arose whether it would really be safe to ride in it any longer. They went to law about it and all the witnesses and experts declared that the car, even for a used one, was absolutely defective. If it depended on witnesses and experts, this would certainly be a case of improper delivery and consequently breach of contract on the part of the seller.

The latter, therefore, entered a plea of a quite different character. In the second-hand motorcar trade, he said, there is a practice, a usage which comes to this that the goods sold are always to be taken with all faults and errors; parties have to observe this custom and consequently John Johnson has no recourse at all. Again there were witnesses and experts corroborating that the custom referred to actually existed.

Now a continental jurist never feels particularly happy when on his way through legal practice he comes across Custom. He then feels like the young man who having married against the will of his parents meets with his father in a narrow alley where he cannot turn to the left or to the right.

How is this?

Well, with some exaggeration we can say that in origin all law is customary law. The tribes which peopled our continent in olden times and from which our peoples arose, did not know written law at first. Disputes were decided in accordance with established custom, or, if it could not be proved to exist, in accordance with 'the five senses', i. e. by the common sense of the judge. Thus precedents arose and these precedents again became custom. The oldest law-books have a descriptive character: they record the existing customs and precedents. From the Old Testament we know that Moses administered justice to the Jewish people long before there was any question of written law. So this must have been done according to custom and precedent.

Well now, continental jurists have become unfaithful to custom. With France and its famous Code Napoléon in the lead they have gone to draw up law-books. It is in these books that one has to find law. Meanwhile the legislator had the good sense to see that occasionally he could not help referring to custom and thus the Dutch law provides that agreements not only bind to what is expressly stipulated in them, but also to whatever, according to the nature of the agreement, is demanded by fairness, usage and law. The question was, therefore, whether this reference to usage had to become fatal to John Johnson.

What is usage or custom? If I am accustomed to take an evening walk, does this custom become law then? Or even if all Dutchmen adopt this custom? Would a man who does not take an evening walk because he does not feel like it, violate law in such a case? It's clear: things are not as simple as all that.

To come at once to the conclusion of our story: John Johnson won his case, for the judge ruled that the custom or practice referred to by law is: a definite line of conduct adopted generally and repeatedly in a definite group of persons with regard to a definite kind of agreements and observance of which is naturally expected; subject to usage are all those who belong to the circle in which it applies. Well now, John Johnson and his seller were by no means dealers in second-hand motor-cars; they were simply two private individuals who had absolutely by chance come into contact; there was no question of their belonging together to a group to the customs and practices of which they were subject.

Very nice for John Johnson, you will say, but what has it to do with our subject? Well, you may have noticed that it was about a law-suit, which at first looked very simple. A decision on *facts* seemed sufficient: defective or not defective, that was the question. Finally it turned out to be a question about *law*. Nay even about the essence of law. Where does the mere regularity in human action cease and where does the typical, binding regularity which is styled 'custom', customary law, begin? There was no help for it; the judge had to establish the boundary line between law and non-law. For the judge a difficult and responsible task! Also for the barristers who argued the case it was a more difficult job than it at first seemed to be. They will no doubt have taken heavy tomes out of their bookcase which as a rule do not so often pass through the hands of legal practioners. While studying, they will have had to carry their minds back to the time when all law was still custom, yet not all custom was law. In what indivisible moment does the moisture on the window of our social life crystallize into the frost-flower with its characteristic form, into binding custom? And what does the codification change in it? It will have cost a good deal of thinking. Sometimes the necessity of it crops up suddenly. It only needs a second-hand motor-car to enter into the case, and then . . .

2. In the records of the case Isaac Barend is described as 'market-vendor' and he will surely not have had an easy life in the years 1934—1940, in which the following story takes place. Europe was suffering from a serious economic depression and business wasn't easy. Isaac Barend found a way. He discovered that filament lamps were a sight cheaper in Belgium than in Holland and he imported them and sold them here at a low price.

Now, as is to be expected in Holland and Belgium, the article in question was the Philips filament lamp and even the powerful Philips concern was certainly not beyond the reach of the economic crisis. It was a matter of supreme importance to Philips to maintain the price-level of their lamps and the years 1934—1940 accordingly witnessed the fight of great importers and manufacturers against 'small men' (often called "boxers" in Holland) who found ways and means to place all kinds of proprietary articles on the market at a low price.

Philips had devised an ingenious system. They had two affiliated companies, and one of them, Pope's Metal filament lamp factories Ltd., used the trademark P.B.L. on all its (that is, properly speaking, Philips') lamps. The Belgian Philips Company also placed the P.B.L. trade-mark on its lamps and consequently it was practically impossible either in Holland or in Belgium to obtain lamps without those letters. And now the game could begin. If a Dutch 'boxer' imported Belgian lamps and then sold them very cheap, Pope took action and said: You, boxer, sell lamps with my trade-mark that have *not* been made by me; you infringe my trademark!

And so it happened that they also took action against Isaac Barend. The odds were that he was going to lose since the Dutch courts had scores and scores of years given as the interpretation of the Trade-marks Act that it is a form of infringement of the trade-mark to sell goods bought from manufacturer A under the trade-mark of manufacturer B.

Isaac Barend, however, did not give in so easily. He gave himself no end of trouble to expose the business tactics of Philips and to show up Pope as a pawn in the game of chess of the powerful mother-concern. He argued that the object was by no means to have the Trade-marks Act enforced, but to carry through their price policy. It was really a case of abusing the trade-mark for a purpose for which it has not been given!

On this ground the Court of Appeal put Barend in the right. The Supreme Court, however, took the ground that when availing oneself of one's right, one is, indeed, not allowed to serve an improper purpose, but that price-maintenance in itself is by no means improper and that a man who has a right cannot be blamed for using this right to serve another purpose than was envisaged by the legislator when granting the right. Thus Barend had to bow before the powerful Philips. Not, indeed, for reasons of power, but for reasons of law.

3. We now wish to go more fully into the point mentioned last. You will have noticed that here, too, the judge had to deal in the end with the question: what is a right? There is no doubt about it: the legislator recognised rights to trade-marks at the time, in order that the holders of trade-marks might be able to prevent confusion between their own articles and those of others. But once he has done this, the holder of trade-marks is allowed to serve other interests as well with his trade-mark (provided they are proper ones). Is this just, just in the higher sense of the word? The annotator of the judgement of the Supreme Court, Professor Paul Scholten¹) points out that in his

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¹) Professor Paul Scholten, Professor in the Municipal University of Amsterdam 1907—1945, exercised a profound influence on the Dutch science and practice of

opinion the Supreme Court with this judgement recognised and protected the private right of the individual. He who would *bind* a person who enjoys a private right, to a definite purpose, a definite interest, fails to see the nature of that right. "It is not a matter of chance that this condition of being bound is soviet-law. It is open to doubt whether soviet law still knows the private right."

We will not try to make out who is right in this important question. What we are concerned with is this. In the case Pope v. Barend, just as in the case of John Johnson, the point at issue was at first extremely practical and matter of fact. In the modern keenness of competition the price-level is still being fought over every day; defective motor cars, machines, unsound articles of food are still being sold. The proceedings about them look a matter of practice, of cleverness, of cunning sometimes. It is not true. It is a matter of justice. Solicitors as well as judges should have an understanding of law, an understanding of its object and function in the world, an understanding of its essential character. Not in every law-suit will this necessity stand out so clearly. But suddenly law makes its appearance: ordinary, defective human law, it looks at you seriously for a moment and in its look you feel that you are face to face with something that is of all times, something that is far beyond you and at the same time something that you have to give a form yourself. It is like this with the whole of life — of which law is an essential part —: we have to make something of it ourselves and at the same time it is far beyond us. The mystery of law is the mystery of life.

S. GERBRANDY

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law. Besides Dutch publications on: Gospel and the law, Law and morality, Law and justice, The Word of God in these modern times, etc. we mention as internationally accessible publications: L'interprétation de la loi et la justice (1933); L'autorité de l'Etat (Recueil Sirey, 1934); Traité de droit civil néerlandais (Paris, 1954; with a preface by Georges Ripert).

CRIME AND RELIGIOUS PROFESSION[1]

The relationship of crime and religion has been a primevally favourite topic of human thought. Criminology has also made this relationship a theme of its discussions. But having readily remarked that criminology has had and has a great and profound interest in this relationship, we have two questions to answer, viz. how exactly it is that crime and religion came sometimes to be so closely connected, and we shall also have to discuss what this connection essentially is. We have to examine what categories, principles and ideas have been in the background of any approach to the examination of crime and religion in any science that was interested in this problem. Since the study of such principles would in fact entail the study of all science of all time, we must in view of the limited scope of an article for the present restrict ourselves to the principles that play a role in approaches presented in criminology.

On the fact of the problem how religion and crime came to be connected, one might remark that such a connection is rather obvious: religion no doubt constitutes a prominent—either genuine or pseudo—part in society and in the life history of a majority of individuals. The connection as such was no problem at all to, let us say, the greater part of ancient and medieval thought. Crime had, especially in the Middle Ages, and from an epistemological point of view, to be put into connection with religion and God. For was not philosophy and in fact all science considered in most of the cases as the *ancilla theologiae?* This did not prevent students from being concerned with the existence of evil, and man's interference and reaction to the evil in his own heart, but it was all taken for granted since one was not saddled with the burden of modern, emperical science. Being the most evident manifestation of evil brought into the world by human action and also one of the most striking proofs of the power of sin in man, crime could on that ground alone, be understood as related with religion. It was but nominalism that endeavoured to break these close ties of affiliation, an attempt that reached its culmination point in positivism.

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[1]) The following notes are for the greater part a further elaboration of the themes and principles discussed in "Position and Subject-matter of Criminology", published in 1956. The views enunciated there have in the present notes been partially recapitulated or referred to.

But in spite of this alienation the interest of criminology in religion has continued, though its character changed. In lieu of investigating the internal and essential relationship of crime and religion, criminology came tot discuss merely external connections, overlooking essentially religious notions.. This lack of understanding is comprehensible if we are alive to the fact that causal thinking became the fashion since the last century and is this still with many a criminologist to-day. It is to be granted that this sort of causal thinking was well-intentioned. Criminology as a science in itself came into being owing to the fact that grave concern was felt about the existence of crime and the harm it did to society and individuals. Scientists tried to help society and the individual by striving after a discovery of the causes of crime, basing themselves on the principle: take away the causes and the greater part of crime will vanish as if by the magician's wand. In respect of our present problem this meant, that science was to find out whether or not religion was to be reckoned among the causes of crime. If this were so, religion would, indeed, be of criminological concern: if not, criminology had better leave alone an investigation into religion. With the aid of the tools provided my positivism, it was also tried to find out whether or not religion might work out as a crime deterrent. Seeing that criminality increased, the question was immediately asked if religion might have a causative influence in this process. In the same way the so-called spiritual school at the end of the 19th century in Europe set to work. They ignored the examination of the phenomenon of religion itself and religion was not given a fair hearing; much less was any attention paid to the nature of religious profession as affecting the whole being of man, the investigator included. Considerations mostly did not go beyond discussing the question, whether or not any increase of criminality might perhaps be due to a decrease of religiosity in society.

Approaches as hitherto presented were for the most part characterized by the following traits: a) the introduction and application of the concept of causality in problems of criminology; b) an extravagant and unjustifiable confidence in the power of statistics to find and to explain problems, also in those cases where statistics seemed evidently unsuitable; c) a most one-sided conception of crime; d) a complete lack of insight into the essence of religion, coupled with an intentional refusal of scientists to speak in terms of religion when discussing religion; they always tried to make a so-called neutral approach, free from any valuation. We will now discuss these traits in successive order.

It would lead too far if we attempted in this place to examine why and for what reason criminologists have always been so keen on the concept of causality. It is ascertainable that they came across the concept in almost all sciences in the last century, human sciences included, holding the concept to be applicable to any problem of criminology, without any exception. It is questionable if students in the human sciences do not make little short of a logical mistake in this matter, i. e. do not confuse cause and condition. For causes will always *necessarily* produce a specific event to come. Conditions only furnish the occasion for an event to occur. A condition is that on which some specific event depends and by which some occurrence is made possible. Cause means necessity, condition involves possibility. By applying the concept of causality and causation in sciences like criminology, where man himself is on the scene, the scholar raises false associations that do not fit the facts of reality. It would be extremely convenient for the human sciences, if man could be conceived as the product of causes: unfortunately it is not true. For crime has no cause whatever, but is only surrounded by accompanying conditions, allowing it a chance to be perpetrated, conditions that are infinite in character. Every condition, however, is impediment and support at the same time. Crime, and consequently criminality belongs to the most secret anthropological levels of mankind. Crime exists in consequence of the depraved and deficient nature of man's being. Man created with an essential capacity to commit crime, will always find conditions that support his crime and may serve as excuse. Certain philosophers excepted, it has always been admitted that man has potentials available to abstain from "causes" that might drive him in a certain direction and it is far from certain that these potentials are measurable. And this notion is not discounted by the reality that under some conditions man may find himself in a state of inability to make use of his potentials.

But as soon as man is accorded this potentiality, the concept of causation has necessarily been deprived of its character. Its essence is undermined and it is not in any useful way suitable for the investigation of our problem.

If nevertheless the concept of causation continues to be applied, this will wear away the foundation of our knowledge. But even if we admit the depraved nature of man, we are far from having to assume a general human urge for crime. For man has at his command potentials to resist crime. As we shall see, he is rather to be conceived as being surrounded by the conditions that are created for him and by him and by his capacity to produce some change in his circumstances. It follows that e.g. faulty education, or poverty due to a certain system of political economy, should never be called a cause of criminality or the cause of a person's lapse into crime. The same applies to the relation of christianity and criminality. If a large part of the population of a certain nation gives up church-going and becomes a kind of irreligious or pseudo-irreligious item in society, losing thereby part of its social and cultural value-systems and social securities, this might perhaps under some circumstances be a condition fostering criminality, but it can no more be called a cause. Irreligiosity accompanied with loss of values creates a condition that appears as the concomitant of an increase of crime. It replaces another condition that prevailed previously. Such an increase is never bound to follow. Unfastening the door is never the cause of its opening. This holds true more forcibly for an individual, irreligious or religious and his lapse into crime.

Religion, the second part we are concerned with, is likewise a phenomenon resisting any causative approach. Whatever notion or principle one may believe to be the essence of religion, it is beyond any doubt that the kernel of religious thought depends on revelation and faith and not on a logical order of things in the ordinary sense. Mere rational and causative cognition will remain ineffective in discussing religious profession and is inadequate for any examination of the relation between crime and religion. Crime is human and religion is transcendental and a causative approach is insufficient for both. The study of criminology in terms of mere causation will lead to strange conclusions. The Dutch criminologist Bonger, who in nearly all his studies adhered to statistical and causative approaches only, made the observation that religiosity or irreligiosity are completely irrelevant to the problem of crime. Well, this is true we daresay, because religion and crime have no causal connection. Only when one clings to the idea that in science it is only causal connections that matter and constitute the only problem to be studied, could this conclusion be drawn. But the consequence is that all approach is thereby paralysed, and this paralysis cannot be overcome except by an endeavour to listen to what man and religion, crime and religious profession themselves, can tell us.

With due alteration of details one might make similar remarks concerning any attempt to reach the solution of our problem by relying on the aid of statistics. Statistics e.g. have been used in some approaches to the present question, when conclusions were drawn from the ratio of the population that belongs to any church or from the ratio of convicts, that profess to belong to a church or to acknowledge religious faith. These data really tell us little that might matter to our question as we shall see below. But let us first turn to the character of statistics.

Ever since Quetelet discovered the regularity of annual convictions, criminologists have had great confidence in statistics. The background of Queteletism was the Newtonian conception of science: what Newton had achieved for natural science, the discovery of the law of gravitation on which all that is matter, depends, Quetelet wanted to do for the study of man. He thought he had discovered the curve representing the continuous variation of human action. He disregarded any cognition of spiritual data, or rather he attempted to fit these data to his curve. The majority of his followers did not make it questionable whether or not man was capable of being known by a curve. It must be said that the statistical data concerning the correlation of the ratio of criminality and the statistically recorded prices of bread, seemed to agree with Quetelet's theories in the middel of the last century and this apparent success of statistics made criminologists less careful in applying them to different problems of criminology. They became reckless and also included the relation of religion and crime in their statistical investigations. A new trend in criminological thought came into being, calling itself, strangely enough, the *spiritual* school. This school attempted to adapt itself to the fashion of the time and tried to retrace the statistically recorded increase of criminality to the statistically recorded decrease of religiosity, making the latter a "cause" of the former.. Once again it was not called into question if perhaps spiritual data were suitable to statistical methods. In defence of the scholars of the spiritual school it must be remarked that the whole of science was by that time overgrown by causal and statistical thinking to such a degree, that any attempt to approach crime and religion in a different way, would be held up to ridicule. In order to be taken seriously, a scientist in that time had to think along the lines of causality. The spiritual school was none the less not aware, apart from the unreliability of the two statistical recordings, of the fact that a very particular epistemological tenet originating from Kantian philosophy dominated all. This philosophy, epochmaking both at the beginning of last century and around the turn of the century, professed a particular belief concerning man. It distinguished between man as a given experience, i.e. the empirical side of man, liable to empirical approximation, and on the other side the intelligible character of man, to be conceived as free and undetermined. Both parts are to each other as phenomenon and noumenon in the world of knowledge. The result is that reason has to limit itself to the former and finds no points of contact with the latter. Any acts of reasonable beings, as far as they are phenomena, are placed under a natural necessity. Since freedom, that is the completed autonomy of the will, is merely an object of thought and imagination, unattainable by experience, Kant finds in the world of phenomena nothing else but the law of cause and effect. In this way he tried to make determinism and indeterminism compatible with each other, by a sharp delimitation of the two spheres. In Kantian philosophy therefore, and now we return to statistics and the notion of the so-called spiritual school, experience, that is ordinary science, has to refrain from any examination of things in the noumenal order. We shall see later how Kant approached religion.

The result was that scientists came to restrict themselves to the external and observable phenomena of religious profession, such as a man's connection with churches, moral conduct, attendance of church-services in prison, in short all those concomitant ways and manners of conduct that are known to belong to religiosity. They referred only the phenomena that by slight acquaintance, lend themselves admirably to the purpose of statistical recording. Scholars of criminology may have been aware of this fundamental insufficiency; they continued none the less in the same way, although they could know that fluctuations of the ratio of churchmembership, may be an indication of anything except the genuineness of religious professions and the factual relation of crime and religion. Religiosity, indeed, is so complicated and may manifest itself in so many forms besides churchmenbership, that ayn knowledge of these data in a statistical form may not bring us any nearer to our object, nor do any data concerning the religiosity of prisoners. Prisoners, influenced as they are by the peculiar and unusual circumstances they live in and their usage by the authorities, are a different kind of man, constitute a different kind of personality. Their attendance or non-attendance of church-services in prison, their statements to the prison-authorities or the prison-chaplain about their religiosity, are determined by their abnormal position of being detained. They are characterized by conditions that testify to the psychology of prison-life, rather than give evidence about the religiosity of mankind in general or the religiosity of perpetrators of crime. We agree of course that in a private conversation between the chaplain and the prisoner in a talk from heart to heart, the chaplain may get to the bottom of the prisoner's feelings but this fact obviously does not lend itself to statistical recording. Let it be understood that we are not disparaging the application of statistics in general. We are only opposing the exclusive and arbitrary application of statistics to any subject-matter whatever, without previous consideration of the question whether statistics can bring us any nearer to the right cognition and perhaps the solution of our problem. For scholars have been known to begin with statistics and on having secured the numbers they think useful, to start explaining these numbers, for the greater part referring thereby to other data likwise obtained by statistics. We take no exception to any hunt for statistical numbers, but merely oppose to the principle that they could serve in every case as a basis for investigation. The study of criminology is a good deal more than making footnotes and marginal notes to statistics.

If we look at the sociology of religion, we find that it also makes use of statistical data, but hardly any sociologist will maintain to-day that the sociology of religion is the key to the mystery of religion. Any approach to religion requires more than sociology alone. How more forcibly, indeed, does this apply to an approach to crime and religion: both of them phenomena that find their essence in the inner life of man himself. It is the more remarkable that so many criminological studies continued to adhere to a statistical approach to the problem, giving up the efforts to reach a more solid basis, in order to guarantee a more satisfying insight into the problem.

All this may be clear from the following example. It has been well-known for a long time, that in many countries, particularly in those with a mixed religion on the continent of Europe, the rate of criminality among Roman Catholics is higher than among Protestants. The variety and the character of the criminality in each group is also largely different. Well, here we have a statistical datum, unexpected before it was discovered and the question is now what to do with it. Observed at the first glance, it cries out for an explanation. Investigators have for this reason wriggled around to find such a solution for this most urgent question. It has been attempted to connect the datum with other data of statistical order, such as of climate, of race, of social coherence of economic wealth, of the ratio of intellectuals and educated people or of celibatarians inside either group. It remained, however, as inexplicable a riddle as before. It is not surprising. For if one tries to explain statistical data by referring to other data of such order, one robs Peter to pay Paul. An explanation of this kind always runs the risk of falling into some fallacy of begging the question. This may happen for example, when something which holds true under particular circumstances only, or in a particular case only, is inferred from a universal premise which is itself established through the particular case to be inferred from it.

An example: The higher criminality of Roman Catholics is due to lower prosperity; higher criminality arises from lower criminality, as the criminality of the Roman Catholics clearly shows . . ! Suppose, however, one desires racial components: Some races show higher criminality than other races because they are more emotional; Roman-catholicism, which is an emotional religion, is professed by emotional races; therefore Roman Catholics have higher criminality! In fact nothing has been considered here concerning the connection between Roman Catholic religion and crime, but only concerning race and crime. The same remark may be considered if one endeavours to apply Weber's theory of the influence of Calvinism on early capitalism. For the greater part this explanation rests on an unspoken and disputable premise that crime and religion are phenomena that can, as far scientific investigation is concerned, be fully understood by reference to data of a quite different order.

One would say that we are saddled with the burden of the question of the higher criminality rate of Roman Catholics. Any attempt to discuss it in terms of mere statistics, is like discussing the question why apples grow on an apple tree and pears on a pear tree: an insoluble and uninteresting question. The relation of crime and religion is quite contrarily based on the multisidedness of the two phenomena. And both phenomena display, among other aspects, a focus of a spiritual character, resisting empirical cognition based on observable and measurable data. Empirical cognition, if possible, cannot be acquired unless it is governed by a selfconscious account of the investigator as to his own foundation, which serves as the starting-point of his reasoning. Such an account is the necessary condition for any attempt to reach the core of the question. It may therefore be doubted whether it will ever be possible to fill the gap between the observable and the noumenal phenomena in their Kantian sense, by basing oneself on the former. When stating the difference in morality and criminality between Roman Catholics and Protestants, one is never allowed to draw any conclusion from this diversity with respect to the standard of these different kinds of religion.

One consequential question remains to be answered. It is the distinction made between crime and criminality. The majority of studies treating of the relation of crime and religion, were concerned with criminality and not with crime. By this distinction was meant that the phenomenon of crime was examined as a social phenomenon of wide range. In other words, it was intended so say that the whole of all crimes in society was to be investigated first, whereas any investigation of a single crime could be relegated to either psychology or the case-study. Such a preference to restrict the investigations was quite peculiarly also founded on a prejudice, viz. the pious wish that the statistical numbers, which are of necessity only limited to great numbers, could provide the most reliable datum in order to serve as a basic study for the crime problem. In fact scholars abandoned themselves altogether to the premises of Quetelet. It must be stated here that a statistical study can never constitute the solid and initial basis for the study of crime. The value of statistics cannot go beyond being an illustration of data obtained by a different approach. This holds true, irrespective of the fact that statistics are of necessity limited to penalized acts which do not completely cover all crimes. For the rest statistical data are of great value to criminal policy. It was, however, the assumption that criminology is only a social science, which gave statistics their preponderant place in criminological investigations. This assumption even made criminology a part of sociography. This last science is not a fundamental one and it will never pretend to be the nostrum to knowledge of the deepest sense of cosmic reality. It collaborates in all respects with other sciences in such a way that an approach to all the aspects of the phenomena that are examined shall be guaranteed. This applies also to the problems of criminology.

The multisidedness of crime and religion demands a previous consideration of the phenomena of crime and religion. Once again it must be postulated that an attempt to conceive crime as merely a social phenomenon or even as merely a psycho-pathological phenomenon will have no chance to find the intrinsic relation of religion and crime. One-sidedness is very often the necessary consequence of the epistemological postulate held by many investigators, viz. the search for methods that are applied to the theme of investigation without previous consideration of their suitability. By doing so one is always in peril of wronging the phenomenon to be investigated and of spoiling our cognition beforehand. The limited scope of this article compels us to drop any desire for further epistemological reflection on the point, but we hope that it will be clear that the investigator has to beware of a scientific attitude that involves ignoration or inadequate consideration of any element that can be found in the phenomenon he is going to examine. It is rather the duty of the investigator to listen to what the phenomenon itself can tell him, but he will never be able to do so if he exclusively applies the methods that suit his convenience. And whenever he might be induced to apply methods from the outisde, his scheme must sooner or later be completed with findings displayed by the phenomenon itself. If this should be neglected, it may happen that substantial elements of the phenomenon are overlooked, to the detriment of the investigator's knowledge.

We can show this for the phenomenon of crime. We all know that crime comprises many aspects which made it a subject-matter attracting many sciences, such as the science of morals, criminal law, sociology, psychology and psycho-pathology. But just as criminology is not a science composed of pieces of other sciences, but is rather to be understood as an independent science having its own province, crime cannot be understood as identical with any one of its aspects. Any attempt to conceive crime as only a social phenomenon or only a psychic phenomenon, will essentially result in neglecting its other aspects. All the aspects of crime are interrelated, the social as much as the psychic, the moral, the legal and so on and we cannot examine one of them without simultaneous examination of the other.

One of the essentials of crime is that it is a prohibited act, and the very fact that crime is prohibited, makes it substantially different from any other phenomenon investigated in sciences like sociology and psychology. If, however, an investigator looks upon this prohibition as merely society-made, he commits already an act of one-sidedness. He will in consequence be unable to study the relation of crime and religion, unless he also conceives religion as merely a society-made phenomenon. He overlooks just as much the legal, moral, psychological and particularly the spiritual nature of crime and religion. A one-sidedness of the same order is committed if one should attempt to restrict crime to the legal sphere only. This time one might conceive crime as an act prohibited by the legislator and for this reason only conceive it as a crime. Any other element of the phenomenon of crime is thereby misrepresented and such a misrepresentation cannot be argued away by assuming that legal prohibition is society-made. For this attempt is no solution because the difficulties are only postponed. The same holds true if we conceive crime as merely a certain kind of psychic behaviour, because this assumption offers no way out of the difficulty how to connect it with the social and spiritual data that are to be explained, unless we see those, too, as society-made. Besides, the prohibitive character of crime needs to be explained fundamentally. Crime offers by no means a possibility of approach based on an exclusion of valuation of one-sided observation of facts.

It should also be borne in mind that crime is a human act, which means that no separate examination of this phenomenon is ever possible without simultaneous study of man. We shall come back to this, but the course of our argument makes it desreable first to turn to religion.

It may be taken for granted that with equally strong reason any one-sided approach to religion must be avoided. Religion, too, displays many aspects, such as spiritual, social, psychological and so on: here, too, any identification with one of the aspects will necessarily obscure the investigator's outlook on the subject-matter he wants to examine. Our task is now to discuss what in fact religion is. Assuming that this phenomenon is almost infinitely complicated, we came already to the twofold epistemological approximation which constituted the Kantian solution to the problem. According to this view the scholar has to limit himself to the phenomenal world in its Kantian sense, because this exclusively accrues to his rational capacity. The student of religion has to avoid any consideration beyond critical reason.

The consequence of this assumption is indeed that many scientists have readily restricted themselves to an examination of the observable and supposedly measurable, Kantian phenomena such as morality, social institutes, psychological expressions and so on. This attitude and epistemological starting-point was, indeed, remarkably favoured by a different time-honoured distinction which reaches back to Cicero and Lactantius. These authors respectively understood by religion a painstaking execution of external phenomena and religious activities on the one hand, and on the other a bond of piety characterized by hidden experiences and glorification of the numinous. In the sociology of religion, for example, as represented in the works of Max Weber, we find an approach to religion consisting in a minute and non-valuing description of all phenomena that proceed from a religious profession of man. Such a description may be of eminent importance, but it is self-evident that it will remain one-sided as long as it is not supplemented by an examination of other human sciences like psychology. Another approach based on the view of Lactantius is the examination of the second part of the distinction, viz. that of religious experience, so admirably achieved by William James in his "Varieties of religious experience". An examination of this kind, however, deals with extremely and intensely religious personalities and their particular experiences, such as conversion and mystical inspiration. These experiences may happen to constitute an integral part of a crime-perpetrator's outlook on his world, but we are not allowed to make them a starting-point of our investigation, not to mention the fact that faith cannot be reduced to experience. We shall have to abandon the idea that we might come any nearer to our problem by describing quite particular crimes that were brought about by religious peculiarities however interesting these cases may be in themselves.

Reverting to the Kantian distinction between the noumenal and the phenomenal world, this distinction is in a particular way different from that made above. For Cicero and Lactantius restricted themselves to observable and human phenomena, refraining from even a mention of spiritual facts or the focus character of religion. Kant alleged the impossibility of the investigating mind to insert considerations of metaphysical speculation. Kantian epistemology is the frontier-police against presumptions of metaphysical speculation that might reach beyond experience. Kant did not think much of metaphysics and speculation as he understood them. By religion he therefore understood not metaphysical knowledge but moral and practical activity. Anything man could do apart from good moral behaviour is mere religious fancy and superstition. Kant truly postulated that reason is incapable of theoretical knowledge beyond experience, but he does grant to reason the faculty of determining conduct. On the one hand he assumes moral conduct to be free from religious heteronomy, on the other hand he assumes religion to be nothing else but the inclusion and essence of moral and ethical duties. His views are to the effect that religion and certainly religious conduct and moral conduct can be identified. It is true that Kant never draws the consequence of his postulate, for he restricted the identity to conduct alone, whereas his followers, the neo-kantians, held the view that there is a complete identity of religion and ethics. Religion in Kant's views, as far as theoretical reason is concerned, is only the cognition of human duties as divine commandments. Human duties are thereby bound up in moral conduct. These views are nevertheless exclusively based on the postulate of the restricted capacity of reason. But as soon as one agrees to the possibility of knowledge beyond reason, his postulate does not hold any longer. His views are, moreover, unacceptable as soon as one agrees to the notion that both in the cognition of religion and in professing religion, man himself is involved which admits of no neutrality. Religion reaches the level of transcendence: it is no moral disposition, no private concern, no moral postulate. Religion wants to be confessed by the whole of man, by a man's totality. Any obscuration of this principle will bar the way to a cognition of religious connection with crime.

As for religion we are in fact concerned with a most peculiar question, to wit that religion for one thing embraces a focus of faith-adopting and faith-inspiring nature. Consequently any human being who is going to ponder on a question, will of necessity base himself on a fundamental principle towards this question. Setting a basis is essential to such an extent, that the refusal to allow oneself such a basis, is a principle as well. No neutrality is ever possible. But granted this inevitability, it is better to be aware of the basis that constitutes the foundation of one's reasoning. Such principles are always religious in this sense that they are the all exclusive and leavening agency of one's being and also and a fortiori of one's scientific approach. For the latter likewise requires the whole of the investigator's being.

Religion, however, is for the other part also a phenomenon to be studied like any other. Religion has been made the subject-matter of scientific approximation, and it followed that religion contains its own focus. And with regard to the study of religion and religious profession we can in truth say that no study is possible but in terms of religion. It means that an approach involves the investigator's faith. This does not mean that only a believing Christian is capable of making a study of religious profession; yet all investigation of religious profession and its connection with crime would be off the target if restricted beforehand to the observable results of religion in society.

Any investigator has to be alive to the principle on which he bases himself. In the second place he should realize that the phenomenon-character of religion requires all one-sidedness to be avoided. The reciprocal connection of the two principles results in the view, that no equivalent phenomena can be included in the examination. Such phenomena are the so-called social religions of Alfred Weber, like democratic capitalism, democratic socialism and soviet-communism. These social religions correspond with genuine religions in so far, that they display a missionary character, consist in an embodied idea and attempt to create a new type of human being. From the fact, however, that we must designate them by an adjective "social", they display their pseudo-character. It follows that they are religion in a certain sense only: that they are one-sided and imperfect, being religions only in a sociological sense. Genuine religions are characterized by faith and worship and by religious profession which is alive to both. Faith is the kernel of religion to such a degree that religious profession is not possible before it receives its impetus from faith.

It would also be one-sided if crime and religion should only be brought into connection as regards their social aspects. In considering them it is inevitable to occupy ourselves with man. Criminology is not a science that makes use of sociological approaches to crime and religion and employs the psychological approaches to both in order to clinch the two in the end. Criminology rather goes straight to the point it wants to investigate and discovers its interdependent aspects. It thereby also finds the essential and positive certainty that crime and religion are human. Crime demands a human being to commit it and religion demands a human being to confess. Crime and religion exist because man exists, they cannot be conceived except by a conception of man and only by the fact that they come to be realized by man, to wit the criminal act and the religious profession. It is therefore imperative to know who man is, to question man himself as to the way we have to follow to reach man himself.

And it is essential that we should be completely sure about ourselves, what image of man we have in mind. We refer here to anthropological assumptions in the modern sense, viz. anthropology as a science that takes account of the whole of man as a total and spiritual being, which makes anthropology a key to other human sciences, criminology included.

We can truly start such an examination of man by pointing to the essential fact that man is living in a world of fellow men and things in such an essential way as to make any examination of man nugatory that conceives him as an isolated individual. Any endeavour to do so would result in a distorted conception of man's being. This does not mean that man is a product of his being with fellow men, as a product of social stimuli. This view excludes the conception of man as a product. Being in a world is rather to man an ontological status which truly creates for him the possibility to be a human being. Neither is man capable of conceiving himself without his world and his design of his world. For this is also a most peculiar manifestation of man's being that although he essentially exists in a world, he is capable of placing himself in opposition to the world, just by forming a design of it. This position involves his loneliness and creates the possibility that he may design his world in a deficient way. Man as a person is the image of God [2]) but this does not exclude his depravation, from which follows the deficiency of man's world design.

Cosmic reality in which man finds himself and to which he opposes himself as an image of God, embraces the world. It is characterized by norms on which it is founded, but it derives its real being from man by whom it is realized. Man named the animals and employs the things of creation. It is, however, these norms created by God in cosmic reality that man has to consider. The normative structure of reality has been created to be observed by man. This constitutes man's existence and means realization. These norms focus in the twofold commandment of the love of God and the love of the fellow man. This is divine commandment and from faith no world design can result but that of love to God and the fellow man. It has been assumed by existential philosophy that the essential status of man of existing-in-a-world involves the being-with-fellow men, there by demanding the love of the fellow man as a kind of inescapable and ineluctable *conditio sine qua non* of fellowship. This reduces the being of man to a being-with-fellow men only and takes no cosmic reality into account. It overlooks in addition the essential capacity of man to hold aloof from his fellow man even without an infringement of the essential demand of love. The norms that command the love of the fellow man are not founded on man's being in the world, but can only be founded on cosmic reality that finds its realization and existence in man and by man.

Now we return to crime. We have postulated that crime is a multi-sided phenomenon, unsuited for the purpose of being examined by exclusively one discipline except criminology, a phenomenon which finds its characteristic in prohibition. Prohibition and penalization, however, are not the same. Some act may be penalized for some reason, although one may still wonder whether it is really a crime. Crime is rather to be conceived as the very transgression of the supreme command to love our neighbour, our fellow man. It is the most obvious manifestation of man's sin and deficiency. If the legislator sometimes has his reason to omit the penalization of an act which is evidently a crime, as—among many others—blackguard and tortuous statecraft, such an act is none the less a crime. The same holds true regarding the opposite, viz. an act which is penalized because the legislator thought it harmful to society. Crime proceeds from man himself who existentially and substantially lives with his fellow men who are to be loved by him lest he may commit a crime. But crime is not founded in man's being with fellow men. If crime were conceived as such, the concept of crime would be in peril of being a mere social phenomenon, as an act merely characterized by its harmfulness to society. Crime would be no more than an act that transgresses the norms of society. It would be an anti-social act and no longer a transgression of the love of one's neighbour. Crime would only in that case be an anti-social act, if there should exist an isolated norm like: "being social" or "being a good citizen" or "being a good patriot". We do not deny that those norms may exist, but they are solely derived norms. They may have been conceived as supreme norms by Plato and Aristotle and by greek thought in general and recently again by marxism and national-socialism, but it was the merit of christianity that it transcended this view by basing man's duty straightaway on the divine commandment of love of one's neighbour. If crime were only a harmful act to society, determined by its harmfulness, and the delinquent were locked up in prison only on this account, we could never find an answer to his embarrassing question, why he is confined and not the rascal who is guilty of a non-penalized act. A crime cannot be determined by its harmfulness but only by its transgression of a divine commandment to love the neighbour.

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[2]) Cf. the views of J. Waterink in "De mens als religieus wezen en de hedendaagse psychologie", Rectorial address 1954.

Returning to norms we find that they do not exist in themselves but find their realization only by man and here lie the difficulties. For man who exists in his world by designing himself a world, is only able to do so in a deficient way. Man is provided with freedom to live his existence, which always demands new choices. His freedom unfortunately only reckons with the capacity to continue his course of life a little further. Man is nescient of the way and the "how" by which he may realize his freedom to love his neighbour and to live with his fellow man. His deficiency results in failure. We are now in the right position to consider further what religious profession means to a man.

Religion, as we saw, can only be realized by religious profession. A man who professes religion is alive to the fact that faith means something to him. He professes his faith so that he believes that faith leavens the totality of being and behaving. Religion and religious profession can by no means, as we saw, be identified with moral conduct, as Kant did. Yet we are quite rightly accustomed to say that one knows the tree from its fruits. He who professes to be a christian and would not display this profession by moral conduct would hardly be a christian. But the question is not as easy as that. For by believing, man does not straightaway become a perfect being and faith does not provide to man the nostrum that guarantees the right and perfect realization of loving the fellow man, in other words, it does not prevent the commission of crimes as our daily experience shows us in ample evidence.

Be it understood that it does not follow from this lack of visible result of faith, that faith and crime are not connected. We have now reached an old topic of theological doctrine, to wit the conflicting views of Protestants and Roman Catholics concerning the good works. The latter assume that the good work is a free act according to ethical laws, involving augmentation of divine grace. The former suppose that works do not count for obtaining grace, but that good faith yields good works, just as the good tree yields good fruits. In respect of both opinions it is true, however, that even so faith, if it has no works, is dead, being alone. And it is common sense that religious profession not resulting in love of the fellow man would count for nothing. We may assume that religious profession carries an intensification of all ethical behaviour by which moral conduct goes beyond itself. Religious profession constitutes in itself the focussing element in the world design that a man has created to himself. Not only that a believing man knows himself to be a creature of God, but he finds in his profession the motivation for his duty to avoid any transgression of the norms framed by God to be adhered to by man.

Nor can religion and morals be disconnected from each other. The Dutch criminologist van Bemmelen [3]) assumes that humanity has to learn to obey moral prescription independent of divine authority. This view however, shows an insufficient insight into what religious profession means to a man's world design. Religious profession cannot but be a focussing agency in a man's being,, influencing the whole of his being. If not, it would be but a common tenet to be bartered for any other. The views we are taking exception to this time, arise from a causative and statistical way of thinking. If good moral conduct were the effect of a cause called religious profession, then it would really be necessary to strive for a reciprocal alienation of morals and religion. The whole of this problem, however, moves beyond all causative approach.

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[3]) J. M. van Bemmelen, Criminologie, Zwolle 1952, p. 312.

To be a christian and to profess religion involves a new way of being to oneself and in one's dealings with the fellow man. The motivation man finds in his religious profession, does not make religion a crime-deterrent, as it has been wrongly conceived in otherwise well-intentioned criminological studies. No religious instruction will ever guarantee a man refraining from crime. Reality has shown this failure and it is even impossible that religious profession could do that, in view of the hardness of our hearts. Any attempt to teach religion in order to use it as a kind of therapy to delinquents, is using religion as a means which it essentially is not and cannot be made. Faith is said to check our vices but in reality it adds to a man's possibilities to commit crime, providing, however, at the same time potentials to fight against it. We must grant that it would be quite easy indeed to assume that the norms prohibiting crime proceed from the divine commandment. That would be so if man were not placed in his most peculiarly human existence. If man were solely determined by the causes and conditions of his milieu, if man were nothing else but a personality's behaviour as response to milieu-stimuli and if no choice were left to him, then the place of the norm would be quite easily comprehensible. Man would then be a being determined by norms as well as by his place in his milieu. Reality, however, shows that choices are always left to him, which arises from his being human. Man has to choose and each choice entails his *reliability*, even if the deficiency of his existence should go so far as to make the possibility of choice invisible. One need not follow the views of Jean Paul Sartre, who conceived man as a being doomed to freedom, to understand that the freedom to choose involves an arduous and serious burden in human existence. Freedom in this sense constitutes the contents of man's deficiency. Man being at a loss what to do, aches for safety and security. Religion gives him such a security by the Law. Modern man understands law mostly as an enacted or customary rule to be recognized as binding. Law is to-day conceived as order and interdiction, anyhow not as an affair to be pleased with, but as a necessary evil. Human criminal law by prohibiting certain acts, grants thereby to man a charter to commit any crime that is not penalized. Criminal law is a deterrent but not an aid to right living. Law, however, in its religious sense is a help to man to find the right course in his life. It is not for nothing that the Jews observe the feast of "Rejoicing of the Law". Religious profession is, therefore, not a crime-deterrent but it is a condition for man to find his way to God and for an existence of being in love with his fellow men.

Finally it remains to ask ourselves the question what practical criminology can do with these remarks. Preaching faith can never be conceived as a means to prevent crime for this contravenes the meaning of faith and religious profession out of all recognition. Any help to the delinquent can only consist in showing the perpetrator the deficiencies of his being and the deficient way he understands himself, and in finding a way out together. By this deficiency, however, a perpetrator of crime is by no means different from any other man who really struggles with the same difficulties, resulting from his own definciency. But a man who perpetrated a crime shows his deficiency in such a convincing way that he can never feel relieved by our merely showing him the possibilities hidden in faith. This sounds like an argument saying: if all remedies have failed, faith might do. We might remember here the well-known cynicism: one priest is better that 10 policemen; which we might interpret in this sense: one priest might be better than 10 prisons or 10 social workers. Man who has been created together wit his fellow men, can only be met by us when we are to him fellow men, who helping him with our own faith, go with him part of his way.

And where faith is concerned, it appears a fortiori that criminology is not a science of observation of empirical facts, but a science where every investigator searches into himself and thereby discovers his fellow man who happens to be a criminal.

H. BIANCHI

ASPECTS OF DEATH IN MEDICINE *)

That death forms an extremely important problem for medical science requires no further argument. A phenomenon recurring so regularly in the medical field cannot be overlooked and even demands a central place in the attention.

The question might be asked, however: how can physiology, which has living matter as its object of study, be interested in death? Is physiology not the science treating of the vital functions of living beings? Fundamentally and in its aim it is in the main experimental natural science of living matter.

The answer could be then that it is the duty of physiology—which as science of functions has become the principal basic science of modern medicine—to show an interest in all the problems engaging the attention of medicine.

The question can, however, also be answered more directly.

First of all we can state then that death may be considered to be a characteristic of all that lives. Living beings have a limited existence characterized by a cyclical course of life of a relatively short duration. There seem to be only a few exceptions to this rule; thus unicellular organisms are supposed to possess potential immortality, to which we shall revert presently. But the rule is that with unerring certainty a process of budding and flowering is always followed by decay and death. Birth, growth, youth, maturity, old age and finally and inevitably death form the characteristic course of all that lives on earth. In the natural course of things death belongs to that which lives. Living matter is bound to die, but by this it is at the same time also characterized by death.

In view of the foregoing it is understandable that it is precisely physiology that has the greatest interest in the problem of death. Although living matter is its object, death is indissolubly connected with it.

It must, moreover, be stated that in discussions and reflections on

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*) Lecture delivered before the combined faculties in the Free University Amsterdam on the fourteenth of February 1956.

life and living beings, death must have its place. For the features of living matter lie just in that which distinguishes the living from what is lifeless and dead. One could say that one has to see death in order to be able to unterstand life and the physiologist who studies living matter, in doing so brings at the same time death within the scope of his study.

Xavier Bichat admirably brings out the relation between life and death. The very title of his book, which for the first time appeared in 1800 and was reprinted in 1955, testifies to Bichat's understanding the fact that the one belongs to the other, for this title is: "Recherches physiologiques sur la vie et la mort." But the relation between life and death is strikingly expressed in the definition of life given by Bichat in his work, which is: la vie est l'ensemble des fonctions qui résistent à la mort. In this statement both life and death find a place in the bond uniting rivals that are engaged in a struggle of life and death.

With this we have quite naturally come to the defining phase that usually forms the beginning of a well-arranged scientific discourse. Involuntarily I have postponed this phase somewhat, thereby—psychologists declare—betraying some diffidence, which is indeed, present and is also justified, for in attempting to define death we encounter difficulties. If we take as definition: death is the loss of life, the formulation is terse, but without real content, since we do not know what life is.

He who should be surprised that even physiology, which is the science of vital functions, leaves us ignorant as to the question what life is, is reminded of the fact that physiology is a natural science. It lies in the very nature of the natural sciences that they can, indeed, study the numberless phenomena—also in their interrelations and in part their causal connections—, but that they are not able to penetrate into the inner nature of things. Physiology is engaged in studying *phenomena* and *manifestations* of life, it is a science of *living matter*. It can find out something about living matter, but what life is essentially, is a secret to it.

It follows, therefore, that the definition which starts from the living matter, would remain nearer to scientific reality. Thus we can say: death is the irreparable loss of the characteristics of that which lives ¹). That it is necessary to speak of an irreparable loss here

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¹) Taking death itself as "negative" characteristic, one would really have to speak in this definition of the "positive" characteristics.

will become clear when presently we shall consider apparent death.

Even more real—and also more realistic—seems to be the definition: by death a living body becomes a dead body.

We are, therefore, concerned here with the absolute loss of the characteristics of that which lives. In physiology quite a number of these criteria and peculiarities are described, which can naturally not be discussed all in this short essay. Those points which I consider the most important, I will try to summarize briefly.

Typical of what lives is a structural and functional organization of a very special nature, which organization makes an exchange of matter and energy possible with the additional power of winning energy and accumulating it, which metabolism in its turn preserves the organization. Both are interdependent.

The particular character of this total organization finds special expression in a dynamic system of regulations, which in an ever varying harmonious interplay of functions ensures a self-perpetuation of the living organism.

If this marvellous co-operation gets irreparably lost, the living object cannot hold its own, the order of the organization becomes disorder and this organization disappears; the metabolism is extinguished and energy can be won no longer. Death has set in and the living organism becomes a dead body where the forces of nature have their own way.

What I called marvellous co-operation just now, by which the living being perpetuates itself and thus resists death, was already so pointedly and beautifully expressed by Bichat when he spoke of "l'ensemble des fonctions qui résistent à la mort". I would only remark that we have to speak here of a typification of the living being and not of life, as Bichat's definition states. For what I described to you—and Bichat's formulation may be considered as a brief, general expression of it—was an attempt at a merely sketchy and fragmentary characterization of *living matter,* in which, indeed, life betrays its activity, but does not reveal its real character to scientific research.

By taking living matter with its characteristics as our starting-point in our definition, and defining death as the irreparable loss of these characteristics, we keep within the scope of science. For living matter is in principle accessible to scientific research and in its characteristics we have at our disposal something of scientific reality that we can work with. In this definition the problems called up by it, have assigned to them the limited ground which lies within the scope of science and thus invite further research. This gives our definition some advantages.

On closer examination, however, they are rather of practical and formal significance than of an essential nature, for the definition has neither caught the essence of the matter nor is it implied. In so far as this fundamental character at least is concerned, we have not got any further, and that is understandable, for the range of science does not permit it to penetrate to the inner nature of life, nor of death, which is the loss of this life.

So there is nothing for it but to remain practical and to realize that a definition should be true, but need not mean that we understand and see through a problem completely, and that it nevertheless can function sufficiently to find our bearings. Taken in this sense there is accordingly no objection to follow Weismann and define death simply as the irreparable loss of life—although this definition brings us no real understanding nor does it satisfy our human inquisitiveness.

Have—from the point of view of natural science—any facts on death come to our knowledge? This is really the case; many facts have been brought to light, of which only a few can naturally be mentioned here.

It is a good custom in physiology—a practice also observed in other biological sciences—, when studying a certain phenomenon or happening among men or the higher animals, to see how such a phenomenon or happening manifests itself with the lower beings. By so doing important data are sometimes obtained.

If this procedure is applied with regard to the death-problem surprising facts are revealed which may enlarge our views of the problem. Of the results obtained in this field of research and the views based upon them, I can only give here a rapid and cursory sketch in broad outline.

Investigations of certain unicellular beings have made it very probable that they are potentially immortal. They avoid death—physiological or natural death, that is—by the nature of their reproduction, the individual dividing into two new individuals. Each half grows to the size of the original cell, divides again into two and so on.

Although after the division the individual has given up individuality, it does not die; there is no dead body and consequently no death.

While the process of reproduction goes on, there is always part of the original substance which is preserved, although ultimately only in very minute particles. Hence the conclusion was drawn that unicellular organisms reproducing themselves in this way are immortal and this would mean then a material immortality.

At first researches by Maupas twisted thorns into this wreath of immortelles. His experiments led to the conclusion that ageing and decay also occur with unicellular organisms, which are manifested in a diminished vitality after a series of divisions and end with death unless conjugation sets in—i. e. the fusion of two individuals—giving rise to a new rejuvenated individual which with renewed vigour is able to go the way of division and growth.

Under natural conditions this will be the course of life of these unicellular beings, with continual intervention of conjugation, of fusion with rejuvenation.

Subsequent researches by Woodruff and others showed, however, that under conditions, artificially made as favourable as possible, the divisions can be continued smoothly and without ageing, waste and loss of vitality—without the assistance of conjugation, for this was prevented.

For his experiments with the isolated cultivation of unicellular beings Woodruff used the slipper-animalcule (paramecium). In seven years he obtained 4500 generations. At the end of the experiment the animals were as lively, fresh and disposed to divide as at the beginning; the divisions succeeded one another as regularly and rapidly as at the outset.

The reports of continued research even mention 8400 generations over a period of 13½ years. Since these experiments can probably be continued at will, if only the price is paid of time, patience and care we can practically speak here of immortality.

I wish to point out, however, that—strictly speaking—only a *potential* immortality has been made most likely, in view of the conditions under which the experiment was carried on, as they had artificially been made as favourable as possible. Moreover, it is of importance to call attention to the fact that in the ordinary divisions a re-organisation of the nuclear apparatus sets in, which happening must be considered to be a process of renewal or rejuvenation. By this so-called endomixis ageing and decay is checked and renewal is rendered possible—also in the absense of conjugation.

From these and similar experiments the conclusion is drawn that unicellular beings are potentially immortal. It may be remarked in passing that it has cost mortals a good deal of time to prove the immortality of "primitive" living matter!

What is the position now in the case of the multicellular organisms? If we first look at the so-called colonies of cells, we find that with certain smaller colonies the cells are identical and for these colony-forming beings there exists the same immortality as for the single unicellular organism.

With larger colonies, however, a division of labour sets in, a specialisation attended with a differentiation of the cells. Here we see a differentiation into body-cells or somatic cells and germ-cells or gametes. Only the latter are theoretically immortal, for they give rise to new organisms with new germ cells; they have preserved the property of potential immortality of the single cell.

The somatic cells, on the other hand, constituting as it were the body of the colony, no longer have within the structure of the colony that has been formed, the possibility of division and reproduction. The loss of reproductive power means the absence of the power of renewal or rejuvenation during the division. The somatic cells are exposed to waste, ageing, decay and death and thus in course of time the "body" of the colony dies and becomes a dead body. Here physiological death appears.

We see that this death appears as a parallel phenomenon of the specialisation and differentiation in a community of cells.

With regard to the cell-colonies we can, therefore, look at the matter in this way that there is a mortal part, the somatic, and a theoretically immortal part, the gametes.

In the cellular state of every multicellular organism, however, these two parts can also be distinguished, the somatic—in the striking formulation of Lipschütz—being the substratum of natural death and the germ cells constituting the substratum of potential immortality.

In the main the same thing is therefore found among the higher animals as well. But with these the differentiation of the somatic cells has made much more progress so that they are further removed from the qualities of the original cell in which all functions are united. Here, too, with these higher organisms, we find a physiological death involved in the differentiation.

During the embryonal development from the egg cell the cells forming the body begin to differentiate, that is to adapt themselves specifically to carry out definite functions. But with it their original properties become latent and they lose the power to develop into new individuals. This quality is only shared by the germ cells.

The differentiation of the somatic cells, necessary for the harmonious functioning of the body, entails, however, the loss or check of the unlimited power of division which means renewal. The somatic cell, originally also gifted with the theoretical potential immortality of the "primitive" cell, —tissue cultures in vitro have once more made this probable—, becomes mortal. There is death. Differentiation and death go hand in hand.

This correlation is also revealed—in the opposite direction—in tissue cultures. Tissues may be taken out of the body and under special precautions cultivated further outside the body on matrices, grafts being regularly made on new media. Under certain conditions it can be observed then that the culture starts growing practically without limitation but in a greater or lesser degree de-differentiation sets in. Latent original qualities of the cells come to life, they recover the power of active and abundant division, in a sense they rejuvenate and recover or approach again potential immortality. But on account of this de-differentiation they become unsuitable for performing a function in a larger and higher organization.

Differentiation is attended with death, de-differentiation with a repression of death.

It looks as if for cells the alternative is between: functioning in a higher organization, differentiation and death and: free proliferation, not functioning in a larger organization and endless vegetation.

After the foregoing we may suppose that in the complex body of a more highly organized multicellular organism not all tissues and organs age and approach their natural end with equal rapidity. Various degrees of differentiation of the component cells will bring about some variation.

On the other hand, starting from the wonderfully harmonious functioning of the whole organism, we might be inclined to think of an ideal physiological death, whereby a simultaneous natural death would occur of all the component parts of the whole. On this point we wish to observe, however, that in spite of the close connection of the parts in a total organism the component living elements nevertheless continue to possess a certain measure of independence.

With the complex organisms, accordingly, the death of the whole is coincident with the cessation of the activity of cell-groups in key-positions, with the discontinuance of the task of leading centres the cells of which are naturally highly differentiated and particularly liable to waste and ageing. The decline of certain cell-groups is introductory to the death of the whole body.

It is not so, therefore, that alle parts die at the same time. At the moment when the whole organism assumes the general aspect of being dead, there are parts which remain alive for a longer or shorter space of time. The harmonious functional interplay of the various parts, making up the totality which constitutes the organism, has come to a standstill, however, at the moment when the organism as a whole dies.

With higher animals and also with man this death, therefore, by no means implies the immediate death of all the cells. Single parts of the organism still show for some time phenomena of life or still prove to possess some capability of functioning.

The best-known example of this is afforded by the heart which—when removed from the body after the death of the whole organism—can by a special treatment (perfusion with a physiological liquid) be made to beat again and can keep it up rather a long time. The literature on the subject states that with rabbits' hearts this can be done two to four days after death, and human hearts could be made to beat outside the body 30 hours after death. Experiments with victims of the guillotine have obtained a sinister reputation in this respect. Thirteen or 14 hours after the execution the heart could be brought to renewed activity which continued for hours.

Other muscle tissue, too, taken from a dead body shortly after death, proved to continue to contract for a considerable time when stimulated, and the cilia of the ciliated epithelium can for some time be seen moving still.

It is clear that in these and other cases in separate parts of the body manifestations of life can still be observed when the whole body is rightly held to be dead.

It seems, therefore, that the moment of death is not sharply marked off. In the literature the view has therefore occasionally been expressed that only when every activity of life in every single part of the body has come to a complete standstill, can this body be considered to be dead.

In my opinion, however, the instant when the functional coherence of the parts into a whole has been irreversibly broken, must be held to be the moment of death, since it is this functional cohesion in the whole, which makes this whole into an organism. The organism as such is no more and is therefore dead when this cohesion has been irreversibly lost.

Once death has found an entry into a part which is indispensable for the continuance of life, there is, indeed, a gradual dying off of the other parts. But this process of dying off will not begin until the functional cohesion of the whole is broken. In consequence this becomes the principal thing and the other phenomenon is secondary.

I purposely used the term irreversible loss of the functional coherence, for it is conceivable that a disturbance, in principle reversible, during which death is already throwing his shadow on the body, may precede an irreversible loss. And it is possible that a disturbance in the functional totality sets in of such a nature that the individual takes on the aspect of death but that the disturbance is reversible or reparable, so that the body is not dead but seems to be dead. In this form of apparent death the individual may balance some time on the borderline between life and death.

Although in the foregoing we have defined the moment of death, this does not mean that it can always be ascertained precisely. Strictly speaking we are only certain about this moment having taken place when the irreversibility is an established fact.

In this connection it is interesting to mention the fact that the Roman Catholic Church takes the view that even a short time after death (normally a few hours) the last sacraments to the dying may be administered, because the moment at which death really sets in, cannot be established with absolute certainty. This safe elasticity of the term "dying" makes it possible that even in a "mors subita" the last sacrament need not be withheld from the children of this church.

The destruction of parts of the organism does not by any means always lead to the death of the whole and in consequence partial death should be distinguished from total death. Nature shows us numerous examples of partial death in which the individual does not perish.

With the higher animals and with man circumscript death of an indispensable organ will naturally coincide with the death of the totality, but if a less important part of the body is affected by death, this need not be accompanied by the death of the individual.

In human pathology we know partial death as the local mortification of tissues, the so-called necrosis. If no important cell-groups are affected by it, the death of the individual need not be involved.

The death of parts of the body also constitutes a natural and necessary element in the economy of the whole organism. Here partial death is a normal phenomenon.

By way of illustration I will only refer to the life of the red blood cells of man. When from the sites of production—where they have already been deprived of their nucleus—the erythrocytes are delivered to the blood, these cells have a relatively short time to live after that. In man the life-span of the erythrocytes in the blood is about 120 days. After that they perish and are cleared away, but new red blood cells have meanwhile taken over the task in the unceasing interplay of renewal and decay. Here death is in the service of life. Thus we see that death is continually in us; there is always a part of us that dies.

Death is so decisive for the object of their activities that the physiologist and the physician—whose practical activity is rather directed to living matter and the preservation of life respectively—in connection with our problem show a special affinity for "borderland conditions" between life and death. We shall now proceed to a discussion of those situations in which life, against alle appearances, is still present.

Numerous living beings may, during a shorter or longer period of time, be in a state in which characteristic phenomena and manifestations of life have either wholly or partly disappeared, although afterwards they are completely in evidence again.

In such a situation the living system is in a condition of rest varying from relative to absolute rest, which may last very long.

Some of these conditions of rest resemble a prolonged sleep with a considerable restriction of the manifestations of life. An example of this is hibernation. Those kind of retreat-situations of living matter are characterized by a deep depression of the metabolism and we are confronted here with a diminution of the processes of life.

There are, however, also other conditions of rest, in which the diminution of the vital functions is so considerable that phenomena of life are no longer perceptible. Here the living organism presents itself in the condition of "apparent death". I use this term as a group name for several conditions which have this in common that the living material has assumed the aspect of being dead.

A well-known example of a special form of apparent death is found in the seeds of plants. Outwardly they seem to be dead, but this is only appearance, and we have here a case of apparent death.

On the face of it there seems to be no difference between a living and a dead grain of seed, but nevertheless there is a world-wide difference between the two, for the dead seed belongs to the realm of dead things, the living one to that of the living beings, and only the living ones come to germination.

On good grounds it is assumed that in the living seed-grain life-processes are still going on, reduced, however, to infinitesimal proportions and living on the food reserves. When they are exhausted at last, the seed-grain dies.

In this example as in other cases we have to deal with a "vita minima", in which the processes of life have been reduced and retarded to the utmost limit, in which the living matter presents itself to us under the aspect of "apparent death".

Under certain circumstances, however, a situation of apparent death occurs in which we cannot but assume that the life-processes have for a time come to a complete standstill. This conclusion is so remarkable and the data on which it is based are so interesting and of such great significance for our views on living matter—and also on death—, that I wish to bring forward here a few of the facts that have been collected.

Thus lower plants and animals were found to have survived after desiccation. With some national pride it may be stated that it was a Dutchman who discovered and described such a process. In the year 1719, in one of his many letters to the Royal Society in London the famous Dutch investigator Antoni van Leeuwenhoek declared having observed that rotifera after a 5 months' desiccation revived on being moistened. This remarkable and spectacular discovery was afterwards confirmed by other investigators and extended with similar observations on the behaviour of other living beings.

In this connection and as a continuation of our story of the seed-grain it is interesting to state that a completely dried seed-grain, kept in an atmosphere of nitrogen, is said to retain its germinative power, even, it is assumed, during an unlimited time. For the present, however, it seems safer to speak of "practically unlimited time" here.

In addition to the observations made after desiccation, we have at our disposal series of observations concerning survival after freezing.

About the beginning of this century investigators direct their attention to this problem and it is remarkable that in recent years this has been the case again. Evidently a problem may be in a frozen state for some time to present itself to us again, fully alive!

Proceeding from communications in the literature of the time on observations made of the revival of animals found entirely frozen in winter, Preyer set himself to an experimental examination of this problem, the results of which were published in 1890.

Preyer showed that frogs can be frozen through and through and that after thawing they can nevertheless "revive" [2]). In his experiments the temperature in the interior of the frog fell to —2,5° C. and the heart was frozen stiff.

Publications of other investigators on this apparent death in the frozen state followed and in the years 1902 till 1905 communications appeared on the revival of isolated tissues and organs of warm-blooded animals that had for some time been stored at 0° C. The human heart. too, was included in these experiments—in this case literally—and it was shown that isolated human hearts, after having been in the refrigerator for 24 hours, could start beating again.

It seems as if after 1905 the interest in these problems cooled down somewhat and only in recent years do we see a distinct revival, especially demonstrated in the work of a group of investigators round Parkes and also in experimental work of others.

In these modern investigations the interest is especially directed to cells, tissues and organs of warm-blooded animals and the attention centres on the survival after freezing at very low temperatures. These generally are at —79° C. (i. e. the temperature of solidification of carbonic acid) or at about —190° C. (realized with liquid air).

The technique of freezing, which proved to be of great importance for the results, was developed and is still making progress. Especially the discovery, published in 1949, that the use of special media containing glycerol, considerably increases the chance of survival, may be called a mile-stone.

Recent research has proved inter alia the following.

Spermatozoa of the cock can survive prolonged storage (e. g. two months) at —79° C. or —196° C., and can even retain the power of fecundation. Spermatozoa of mammals of various kinds also survived these temperatures, but only when cooled off slowly. Human spermatozoa proved to be the most resistent and they even stood the cold fairly well without the addition of glycerol to the medium.

Human red blood cells were stored for six months at —79° C. [3]), then thawed, freed from glycerol and transfused. After transfusion these cells continued to live normally in the blood of the recipient. There proved to have been no ageing, for the life-span after the transfusion did not differ from that of transfused fresh erythrocytes.

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[2]) Properly speaking this expression is not correct and could only be used really if life should be lost. We have retained the term, because it is in common use.

[3]) The normal total length of life in the blood is about 4 months.

Tissues and organs, too, were subjected to the experiments and in a few cases results of survival were already achieved.

It will not be surprising that in this "boom" period of the freezing experiments, experimenting with whole animals was likewise revived; now it was warm-blooded animals that had to face the cold.

Thus Lutz (1950) succeeded in reviving caviae in which the heart had stopped up to 72 minutes, and the internal temperature had fallen to 0—1° C., without injuries being observable afterwards. His treatment of this cold apparent death brought complete recovery only in a relatively small percentage of the cases, but improvements in the technique of the treatment can be expected. Andjus (1951) obtained similar results with rats; in that case the colonic temperature had fallen to 0—2° C. and the heart beat and respiration had been suspended forty to fifty minutes.

In the experiments of Smith, Lovelock and Parkes (1954) on hamsters a colonic temperature was even reached below 0° C. and it fell to —5.5° C. The frozen animals felt like wood and the ears had the consistency of cardboard. The investigators assumed that the interior of the hamsters was not yet or only slightly frozen. In these experiments, too, a complete revival was observed after a certain treatment.

Looking more closely at the series of experiments in connection with desiccation and freezing of living matter—leaving out of account for the present the experiments with warm-blooded animals—we must state that under the circumstances no metabolism can take place. In case of desiccation there is no water and in freezing it turns into a solid condition, and no metabolism is possible without water. Besides, the low and very low temperatures in the freezing experiments in themselves already make it impossible for the life-processes to continue.

We are to assume, therefore, that under these conditions the processes of life have completely come to a standstill and here we can no longer speak of "vita minima"; the only suitable term is "vie latente", introduced by the renowned French physiologist Claude Bernard.

During the "latent life" the dynamic living system is as it were fixed in a temporary static rigidity. It is not dead, for it is still possible to kill it. The living system, arrived at complete rigidity is only apparently dead and it can "revive", in that it can show afresh phenomena of life and manifestations of life, it can continue further the processes of life that had been arrested. But this means that the potentialities of life must still be present.

Here it seems as if the secret of life is placed right before us, — but we are unable to fathom it.

The history of research in the science of living matter teaches us that again and again scientists thought that they had come very near to the solution of the riddle of life, but disillusionment always followed. The pursuit of the secret of life is like a journey into remote distances, the object proving to be the ever receding horizon. —

I may mention as a curious circumstance that in a condition of latent life the "clock of life" has stopped; hence no ageing will take place in such a situation.

In the case of those frozen animals the body of which has not been frozen through and through, we cannot speak of "latent life", because the life-processes will not have come to a complete standstill. However, they will have been considerably retarded and diminished and the metabolism—after the attempts at compensation have come to rest—will have been greatly reduced so that in this case a "vita minima" will have been approached.

In nature conditions of rest and of apparent death occur as normal phases in a cycle of life (e. g. hibernation, cysts of protozoa), in order to preserve the living being, we assume, through bad seasons and other unfavourable circumstances. Moreover, apparent death will also occur in nature more incidentally (desiccation, freezing) and especially in such cases will the resistance of the living organism against death manifest itself. The afore-mentioned experiments clearly prove once the more what living beings can stand.

Life is often called frail and in a way living matter is no doubt delicate and unstable and it may easily be destroyed. On the other hand, however, the experiments discussed also prove how strong and stable it can be.

How now is the situation with regard to human beings, particularly during freezing and exposure to cold? Can the human organism endure what some animals were shown to be able to stand? Can man also freeze and live on after thawing?

People are known to have frozen to death or to have died of cold and also apparent death may occur, but exact data, furnished by incidental cases, are scarce.

In the older literature on the subject cases are mentioned of successful attempts of reviving persons whose temperature had fallen to 26°—24° C. A temperature of 22° C. was supposed to be practically always fatal, although an occasional instance was described in which a man was seen to revive after the body temperature had fallen to 20° C.

The usual literature, naturally comprising only cases of unintentional excessive cooling of man, brings, however, few particulars and little information of special scientific importance in connexion with the problem of real freezing and revival of human beings. This is understandable because the attending doctors will direct their attention rather to attempts at saving the patients than to making exact scientific observations.

In Nazi-Germany, indeed, disgusting "experiments" also on the subject of death by exposure to cold were made on human beings, namely on victims from the concentration camps and on prisoners of war, but these "experiments"—which rather deserve the name of tortures and in which it had often been decided beforehand that they were to end in death—proved the moral degeneration of the responsible leaders and of the professional ethics of the doctors and investigators more than that they furnished important facts. We wish to state emphatically that such experiments cannot be in the slightest degree justified by important data that may be obtained—on the contrary, they remain the marks of an appalling decadence and degeneration.

These experiments—which are, moreover, also open to serious criticism of a technical nature—were thought to lead to the conclusion that at a rectal temperature below 30° C. there is always danger of life, while at somewhat lower temperatures death was said to be inevitable. In this field of cold-tolerance the results obtained from so much suffering did not bring very important information and we can only with abhorrence pass by the relative sad literature.

Consequently but few good observations were known about cases of real freezing and reviving of human beings in some measure comparable with what had been found with experimental animals.

But then, in 1951, in Chicago a case presents itself of the freezing of a human being, which could be observed well, and which until recently was considered to be an authenticated "record". Until recently, for a few days ago this record was broken!

The frozen frogs, caviae, rats and hamsters then received—be it only to a certain extent—a human counterpart in a frozen woman.

Early in the morning during a spell of severe frost a policeman found a young woman in a Chicago alley, who seemed to be dead. Her body felt as hard as a stone. After a short time, however, the "corpse" uttered a low groan and this fact caused her to be removed quickly to a hospital.

She proved to be a woman sometimes called in America "a tough girl" and she was "a good acquaintance" of the police in the unfavourable sense of the expression. She had fallen down drunk in the street and had lain there during the night, while there was a fierce frost, the environmental temperature amounting to about 24 degrees C. below zero.

When examined in the hospital the woman proved to be literally frozen stiff. Her limbs were hard as a stone, cold as ice and also the abdominal wall felt quite stiff. The jaws were tightly set and the staring eyes were crystal hard. It took an hour and a half before a thermometer had been found registering low enough to take the rectal temperature and then it only amounted to 18° C., that is a good deal below the point which was generally considered to be fatal.

The pulse could not be felt, the blood-pressure could not be measured, which is not surprising. Only a very slow and superficial respiration was discernible.

The patient was thawed (which was accompanied by a certain treatment, which has by no means been shown to have had any effect) and after about 12 hours the rectal temperature amounted to 30° C., pulse and respiration being almost normal again. The woman awoke from her cold coma and spoke the, in this case certainly not exaggerated words: "I am cold".

A day after her admission into the hospital the patient was pretty normal again, the temperature amounted to 38° C., there was sensibility in the limbs and the woman could see perfectly well, although 24 hours before her eyes had been frozen stiff.

So in this case we have at our disposal a valuable, though not very dignified, human supplement to the many observations of frozen animals which revived again after thawing. We must, however, state that this woman was certainly not yet frozen through and through, which was also shown by her rectal temperature, which, moreover, far exceeded the internal temperatures realized in experimental animals. This does not alter the fact that the case of the "deep freeze woman", under which designation this case appeared in an American periodical, furnished most important data and among other things showed clearly that the human organism can survive extensive freezing, though in this case it was not total.

One may wonder if certain circumstances have made their influence felt, if e. g. the race (the woman belonged to the American negro group), the rapidity of the freezing or the alcohol may have contributed to the favourable result. The doctors in attendance have made the supposition that the alcohol of which the woman had drunk a great quantity has had something to do with her surviving the freezing. The possibility is not excluded and we might, for instance, think of an action similar to that of glycerol and other substances which increase the resistance of cells and tissues against destruction by freezing.

A popular view was reflected in the question of a reporter whether the alcohol might have acted perhaps in the same manner as "antifreeze" in a motor-car radiator!

This woman, whose name till the moment of the remarkable incident which happened to her, appeared only in less honourable association in the police files, now holds a more honourable record in medical literature. Things may take a turn!

However, from this place of honour this woman has been dethroned, for it was reported on the sixth of February 1956 that a human being survived freezing with a still lower body-temperature. The case concerned a two-year old girl (also belonging to the "coloured people" group) who was found frozen stiff, the rectal temperature amounting to only 16° C. The girl survived this freezing and with it became the holder of the world record.

When compared with the test animals this is but a poor achievement. Until now no equivalent human counterpart was found of the completely frozen and then revived animals at a colonic temperature about and below zero. The foregoing instances, however, are at the moment the best approximation.

In this connexion I may refer to recent attempts to apply in certain medical treatments a considerable reduction of body temperature created deliberately.

By artificial cooling a hypothermia may be brought about in which the processes of life, among them metabolism, may be repressed, a phase of resistance having first set in against the cooling shown among other things by a tendency to increase the metabolism. When this resistance has been broken through, the body temperature falls and with it the life-processes and metabolism diminish.

In this the organism, therefore, goes in a direction which, continued in the extreme, would lead to a "vita minima". As a consequence of this it may be expected that the tissues and organs have a reduced need for oxygen and will be able to endure a lack of oxygen longer. This will be of special significance for the brain tissue, which normally is proof against lack of oxygen only a very short time.

The organs—and this will, therefore, especially refer to the brain—would now be able to stand a somewhat longer interruption of the blood circulation without permanent injury. For certain surgical operations this would be of the greatest importance and thus we see hypothermia applied in modern surgery, for example in operations on the heart.

Again, there is a modern medical method designated by the name "hibernation artificielle" or "artificial hibernation". Technically it consists of a combination of a medicamentous blocking, especially of the autonomous nervous system, with a deliberately created cooling of the patient.

With risky operations and very heavy traumata "artificial hibernation" which aims at preventing or removing „shock" is said by adherents of this method to be of life-saving significance.

Very revolutionary thoughts form the basis of this treatment, for the necessary cold, which under the relative circumstances is usually considered an enemy to be combatted energetically, is now made a life-saving factor. In this method it is also tried to suppress the physiological counter-regulations of the organism against "shock", whereas up till now the object was to strengthen them.

Being a physiologist, it is not easy for me to believe that the reactions of resistance made by the organism against the various menaces threatening its existence are not appropriate. It is possibly not correct to strengthen them, but this does not mean that we should check or eliminate them; there remains the possibility of giving free scope to this resistance within the framework of a certain treatment. Therefore I am in such cases more in favour of a hypothermia in a state of narcosis, which leaves the vegetative process intact as much as is possible and gives it the chance to take place optimally, undisturbed by interferences from higher brain centres and the sphere of consciousness.

By the side of favourable experiences severe criticism has been heard. In my opinion the problem of "artificial hibernation" is still in the experimental stage, and a well-balanced, definitive opinion cannot as yet be given. Further research is necessary, the central object of which will in my opinion have to be to ascertain whether the organism during artificial hibernation or a hypothermia is better proof against injuries.

There are indications of this, particularly when we look at natural hibernation, which, however, should not directly be compared with artificial hibernation. In the older literature on the subject reports can be found about increased resistance against intoxications during natural hibernation and the results of recent American researches point to a greater resistance against Röntgen rays.

Within the frame of our discussion hypothermia and artificial hibernation are of particular interest, since through these methods it is definitely tried after all to push the organism in the direction of a "vita minima", it being with some ground assumed that there is a certain indifference to injuring factors under those circumstances. The interesting point in this is especially the fact that attempts are made to ward off death by *diminishing* the processes of life.

As part of my story about the various degrees of reduction of the life-processes and about phenomena of apparent death, I also wish to mention that form of apparent death, which has acquired a certain notoriety among laymen and which in the imagination of the public hovers about now and then like a nightmarish apparition, carrying with it horrible associations with "being buried alive". I will pass by creepy stories about this theme and restrict myself to a few more matter-of-fact remarks.

In the foregoing I referred to disturbances in the functional coherence of the organism, in principle reversible or reparable, which will bring it then in a condition of apparent death. The certainty of having been confronted with such a situation will naturally only be obtained by the revival of the individual, spontaneously—which will be of extremely rare occurrence—or after the application of artificial means.

Instances of recovery from a phase of apparent death previous to death I saw in dogs in the course of my researches on the treatment of acute fatal haemorrhage, the first results of which were published in 1934.

By an intravenous infusion—preferably of a 0.9 % sodium chloride solution—dogs were saved which without treatment would undoubtedly have suffered fatal loss of blood. A few times after the bleeding of the animal it had to be diagnosed "dead". The intravenous infusion made the animals revive, however, so that the diagnosis had to be altered into "apparent death".

A clinical counterpart of these experiments in a human being is for instance found in a case of the American doctor Elmer Hess, who communicated it to me à propos of one of my publications on the life-saving effect of the intravenous infusion of a common salt solution in acute fatal haemorrhage.

Elmer Hess was summoned to a hotel to see a man who had cut through great vessels of the neck and wrists, and who had really bled "empty". The "coroner", the official medical examiner, who is likely to have had some experience in establishing the fact of death, had already pronounced a verdict of death. Hess had the victim removed to a hospital, tied off the vessels and gave an intravenous infusion of 0.9 % sodium chloride solution. To the surprise of every one the man, whose pulse or heartbeat could not be observed before the infusion, was seen to revive and after a fortnight he was able to leave the hospital.

Of course this man has not been dead, only apparently dead, but in this instance the condition lasted a relatively long time. This case clearly demonstrates that a condition of clinical apparent death may sometimes continue for a considerable time.

From these and similar experiences it follows that life-saving efforts should not be discontinued too soon or be considered as altogether illusory. The validity of this conclusion was once again proved in particular in the so-called electric trauma, after which apparent death has been repeatedly observed. Experts in this field point out emphatically that artificial respiration (for which at present good apparatuses are available) and the other life-saving measures are to be continued for a long time—8 to 12 hours—in contradistinction to a term of two hours, as was adopted formerly.

A reversibility of functional disturbances which generally mean death, has also been demonstrated in human beings under different circumstances. Thus it may be possible in the operating room in cases of cessation of respiration and heart beat to obtain a revival by quick measures, among which the rhythmical insufflation of oxygen, together with the application of cardiac massage, the thorax being opened. Should the heart show ventricular fibrillation [4]) or should this phenomenon appear during the treatment, attempts should moreover be made at defibrillation, e. g. by the application of an electric shock to the heart.

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[4]) Rapid, irregular and ineffective little contractions in the ventricular muscle, a generally fatal phenomenon.

Similar revivals can also be observed in a sudden arrest of heart and respiration in certain diseases, if conditions for the attempts at a resuscitation are favourable and can be carried out quickly.

Cases of cardiac arrest have been described in which after massage of the heart of more than half an hour, the regular heart action set in again and the apparently dead patient awoke again to live on fully recovered.

In such cases we strongly obtain the impression of a return from a "no-man's land" between life and death. Expressed in scientific terms this is the recovery from a reversible phase in a process generally leading to irreversibility, that is to death. Not a dead body revived, but an apparently dead person.

In conclusion I wish to devote a few words to an altogether different aspect of death in medicine. The indifferent scientific discourse, making a somewhat cool impression, will make place now for a warmer and more human approach.

We have considered some problems of life and death in the typically scientific attitude. However, the confrontation of the physician with death and dying is not of a scientific and technical nature only. Of course a doctor should above all be the skilled, professional man, and he should be that to the very end, but next to it—or really all through it—there has to be the human approach.

This human side should, indeed, be in all his work, but it will especially have to come to the fore when all his knowledge and capability are doomed to fail. When death approaches unavoidably and the doctor has to bow his head, he stands aside, an ordinary mortal, who sees the last hours of the earthly life of a fellow-being passing away. The sympathetic humanity, a respect for the great event that is happening to a man just as we are ourselves and a deep awe and reverence for what this means and comprises, there are qualities that now stand out in particular. We see the phenomenon of dying and death also as one confronted with the mystery of dying and death.

In this attitude I will finally approach some aspects, not to elucidate them fully, but rather to hint at them.

We leave here the safe ground of exact science and surely there is no opportunity here for easy generalization in objectivity, for the subjective takes a prominent place. Thus it will make a really heaven-wide difference whether one looks upon death in some such manner as "that's what all this differentiation leads to" and as the final, definitive end of all, or whether one sees death in a totally different light in which the succumbing of a "case" without any perspective, becomes the dying of a man who expects another continuance of his existence.

One's own faith is decisive as to the view on death and this applies to the doctor as well as to the patient who is doomed to die and who is under his care. This means that the doctor although holding on to his own established convictions, should respect the views of his patient or those of the latter's surroundings. The manysidedness of religious and other ideas is reflected in every mixed medical practice and this will demand reverence, understanding and tact of the doctor.

Nor will a doctor as a rule venture into the pastoral domain, which is the province of the competent spiritual shepherds, a close co-operation with whom is essential.

Now it is a fact that many people only find themselves confronted with the questions of time and eternity in their real and deepest significance, when the end is approaching. The doctor who stands in a firm faith himself, need in such a case not avoid an open and straightforward talk, when the wish—mostly in a very indirect way—is expressed for it. He should, however, rather aim in such circumstances at becoming the intermediary for summoning the proper spiritual guide and he should not act persistently as the substitute of the spiritual adviser. Only emergency cases can justify a certain measure of substitution in this domain, just as the non-medical man in the absence of expert help in the medical field will try to help to the best of his abilities.

One need not seek far to discover how the fear of death hovers round among us humans.

Fright of death is also met with among animals; fear of death is only known by man. This fear, which can reveal itself in many ways and in different forms, is then concerned with what is coming after death, but much more still with what happens in the process of dying or with the conception one makes oneself of it. It is understandable, for also he who has a definite view of death, may nevertheless ask himself deep in his heart, in fear and anxiety, how the meeting will be with his own death when it is supposed or known to be close at hand in full reality and what manner of dying will be allotted to him.

Dying is an absolutely individual happening and personal experience, in which one is deprived of all real enlightenment, and the realization of this may furnish the conditions of a certain fear.

About this extremely personal domain schematizing science will have only very little to say, and besides, on the subject of dying it has only a very limited field of cognition assigned to it. Only in the sphere of faith can there be balm here and only one's own living faith can enlighten and relieve dying and death.

From the general things that science and experience can say about dying, I will bring forward a few points.

In the first place we must remark that dying is presumably "experienced" in a manner different from the impression received by the spectators. Further we can say that besides anxiety and agony of death euphoria [5]) and also apathy, a merciful veiling of consciousness and a peaceful falling asleep are frequently seen. Death can be gentle, like the gesture of a mother resting her hand on the head of her restlessly tossing child and putting it to sleep. We also know the sudden death without agony and in the aged we often see the gradual extinction of the flame of life without a death struggle.

Hoche, therefore, declared ,,dasz die Menschen im Durchschnitt viel anständiger sterben als sie es sich selber zugetraut hätten". Although personally I feel there lies a measure of arrogance and conceit in statements on dying which must necessarily be based on judging the outside, Hoche's view, nevertheless, also seems to contain a good deal of truth.

What strikes me most in man's passage along the last part of the path of his life, on the way to meet the Unknown, is—seen through human eyes and possibly experienced quite differently in reality—the absolute solitariness and complete loneliness on this journey, where no friend or intimate is our companion. Dying seems, indeed, the most solitary adventure awaiting us.

May in this extreme loneliness the hope be realized that there *is* Some one who goes with us and takes our hand.

How well are this frightening solitariness and the call for the familiar feeling of a supporting hand expressed in the deeply felt poem of Kees van Duinen which he destined to be prayed in the last agony of death and which ends with the supplication:

"Give me Thy hand and then walk close beside me!
Perhaps with Thee I find the pathway home!
Perhaps with Thee I break this awful darkness.
Give me Thy hand! I am a fearful child!"

A. W. J. H. HOITINK

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[5]) Sense of well-being.

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NEWS ABOUT THE UNIVERSITY

RECTORAL ORATION

On the occasion of the 77th anniversary of the University the Rector, Professor Dr. W. H. Gispen delivered an address entitled: *The Wise Men in Israel*. The full text of this address is published in another part of this issue.

THE FREE UNIVERSITY AND HUNGARY

In connection with the events in Hungary a prayer meeting was held of the members of the academic community on 7 November, 1956. The Free University has joined in the strong protest of all Dutch universities and in the expression of their sympathy and compassion with the Hungarian people. The Board of Directors of the university and a committee specially set up for this purpose raised the funds necessary for the study of four refugee members of the Hungarian resistance movement. Other Hungarian students came to the Free University to complete their studies through the intermediary of ecclesiastical bodies.

ACADEMIC HOSPITAL

A few months after the building of an academic hospital had begun on one of the last days of 1956, Mr. F. H. A. Kothe, physician at the Hague, was appointed director of this hospital. The Faculty of Medicine is anxiously looking forward to the completion of the building, which cannot be expected, however, before 1962.

ANNUAL CHANGE OF THE RECTORATE

On September 18, 1957 the Rector of 1956/1957 Professor Dr. W. H. Gispen handed over his office to the Rector for 1957/1958 Professor Dr. G. H. A. Grosheide F.Wzn, professor in the Faculty of Science for the instruction of Mathematics and Astronomy.

The number of students enrolled in the past academic year amounted to 2259 (as against 2139 last year). Distributed over the various faculties the numbers are as follows:

Theology	365
Law	206
Medicine	211
Science	480
Arts	216
Economic sciences	442
Psychology	186
Political and Social Sciences	40
Sociology	50
Notarial studies	19
More than one faculty	44

On September 20 and 21, 1957 338 students were enrolled for the first time. The following table shows how they are distributed over the different faculties:

Theology	33
Law	25
Medicine	44
Science	77
Arts	45
Economic sciences	41
Psychology	40
Political and Social Sciences	7
Sociology	22
Notarial studies	1
More than one faculty	4

INAUGURAL ORATIONS

On Friday, 12 October, 1956 Dr. L. Onvlee entered upon his office of Professor Extraordinarius in cultural anthropology in the Faculty of Literature and Philosophy with an address entitled: *We, men* [1]). The full text of this oration will in due course be published in the Free University Quarterly.

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[1]) *Wij mensen,* J. B. Wolters, Groningen, 1956, (27 pp.).

On October, 12, 1956 Dr. D. S. Attema assumed the office of Professor Ordinarius in the Faculty of Literature and Philosophy with an oration entitled: *Some essentials of Mohammedan thought on Christianity* [2]). Here follows a summary of Dr. Attema's address:

The object of this address was to show how in the course of centuries the toughts about Christianity contained in the Koran were worked out in detail and dominate the minds down to the present day.

To this end the speaker first gave a survey of the views that are met with in the Koran about Christianity.

It was pointed out how at first Mohammed held very favourable opinions about Christianity and also about Judaism, for he thought that they held the same ideas: both they and he had received from God certain communications from an ur-book preserved in Heaven which communications naturally tallied completely, only the language was different and the form in which these communications were imparted. Gradually, however, it became clear to Mohammed that Christians and Jews by no means taught the same things as he did, but that they were on the contrary widely different. The wish to maintain the proposition put forward by him, to the effect that Jewish and Christian thought agreed with him, induced him to say that the dissimilarity only arose from the fact that the revelational writings of the Jews and the Christians, which had at one time agreed with his, had been falsified and altered by them.

Mohammed now argues that the revelational writings of Jews and Christians had already predicted his coming, but Jews and Christians deliberately withheld these places and dit not speak about them. He also opposed the idea of the Divine Sonhood of Christ, and would not hear of the Trinity either: all these things had, according to him, not been in the original gospel. He also declared that Christ had never been crucified, but had been taken away beforehand.

After this exposition of the thoughts about Christianity in the Koran, Mohammedan tradition was discussed. In it the attempt is clearly perceptible to prevent the belief taking hold among his followers that Mohammed was less than Christ. This is the reason why special mention is made of many miracles that Mohammed performed, according to tradition, in which he had far surpassed Jesus.

In this tradition we also find a first attempt to work out the idea that already in the revelational writings of the Christians Mohammed had been predicted. But it was done in much greater detail by Ali at-Tabari, a ninth century author, whose views now came in for ample discussion, since his opinions are again and again used by later authors.

Starting from certain hermeneutical rules he succeeds in finding Mohammed in such places as Ps. 48 : 3; Isa. 63 : 15. All those places in the Old Testament that speak of fight and victory, of triumphant armies he also considers to refer Mohammed, as they cannot apply to Christ, since Jesus emphatically refused to use a sword, which Mohammed dit not. Places like Gen. 16 and 21, Deut. 18 : 15; 33 : 2—3; St. John 14 and 16 are also cited as referring to Mohammed.

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[2]) *Enkele hoofdmomenten uit de Mohammedaanse gedachten omtrent het Christendom*, J. H. Kok N.V., Kampen, 1956, (28 pp.).

The author who went furthest in developing the idea that the revelational writings of Christians and Jews had been falsified, was Ibn Hazm of Cordova (993—1064). His main views, therefore, received a more detailed treatment. He points to the difference between the Masoretic text and the Septuaginta. In his opinion the text suffered much in the time of Israel's decline and especially in the time of the exile. He also stated that the gospel had sustained damage in all sorts of ways in the time before Constantine; his conclusion is, accordingly, that little has remained of the original. Whereas in this way the integrity of the revelational writings of the Christians was attacked, high praise was on the contrary given to the Koran. Reference was made to its inimitability in language, style and thoughts and it was praised as *the* miracle achieved by Mohammed.

The Trinity, too, was repeatedly controverted. The Christians defended it in all manner of means. Several authhors of the Jacobite and Nestorian churches with the views they held on this point were briefly discussed. They particularly defended the doctrine of the Trinity with the idea that the three Persons in the Godhead can be compared to three properties of the Divine Being, which qualities are specified as: life, knowledge and wisdom. The Moslems often exercised immanent criticism on this, really less felicitous, representation. They also analysed the metaphors employed by the Christians, of the fire with its sparks and its glow, and of the sun with his light and heat, and tried to demonstrate their untenableness.

Finally modern tomes were discussed. It was shown that the old ideas are still making their influence felt. A recent publication from Cairo, trying to examine the fundamental thoughts of the gospel, unconditionally adheres to the view of the Koran that there was no crucifixion. To-day the Koran is still spoken of in high terms, all kinds of modern assets and acquisitions are said to have already been predicted in it. In contradistinction to Christianity Islam is further often put forward as the religion of the exact mean, as previous authors had also done.

Along with it attempts were made to determine in a new way the relationship to Christianity. It is especially the great reformer Mohammed Abdu who advanced new views. He concerns himself with the question whether the political, social and scientific decline shown by Moslem countries, have their origin in Islam and whether the great revival of the West is due to Christianity.

He denies both. He argues that, on the contrary, original Islam, which should not be confused with the empiric Islam of to-day, was a culture producing force of the first rank; not so Christianity, however; in not a single respect. In his argument he then goes on to idealize original Islam greatly, whereas he pictures Christianity and what it has achieved, in the darkest colours, so that he arrives at the conclusion, also drawn again and again by other authors, that as a culture producing factor Christianity cannot compete with Islam.

He thus gives in a modern way expression to what also urged those before him: in Mohammed the final revelation was given; the thoughts of the Koran far exceed all others and the feeling of superiority which was produced by it and was present in Islam from the beginning, is to be maintained also at the present day undiminished.

On 23 November, 1956 Dr. H. Brunsting assumed the office of Professor Extraordinarius in Classical and Prehistoric Archeology. In his inaugural address he spoke on: *Crete and Mythology* [3]). Here follows a summary of Dr. Brunsting's address:

In interpreting archeological facts it is sometimes possible, especially when historical data are lacking, to make use of stories from mythology. This is, for instance, the case with pre-historic Crete, about which a few stories are met with in Greek myth.

'The Cretians are always liars, evil beasts, slow bellies' the Cretian Epimenides is reported to have said about 500 B.C. In his letter to Titus the Apostle St. Paul quotes this line with approval. In his days the statement was usually associated with one great 'lie' imputed to the Cretians: the fact that Zeus, the chief of the Greek gods, lay buried in their midst. One of the places marked as his grave, is Mount Jouktas, near Herakleion. On the top lie the remains of a shrine from the bronze age, a cultural period called in Crete the "Minoic Age", more or less between 3000 and 1000 B.C. It is not certain, however, whether this was the famous grave of Zeus: other possibilities still remain.

Together with the Director of the Greek Archeological Department, Professor Marinatos, the speaker had the opportunity last summer to examine one of these possibilities, by excavations in the village of Archanes, situated in the immediate neighbourhood. Remains of monumental buildings and retaining walls appeared, the original destination of which is not quite certain yet. Apparently a shrine also stood there, but it need not be the 'grave of Zeus'. In any case the foundations that were found, belong to a town or perhaps to a palace, like those that have already turned up in Crete. A continuation of the investigations has been planned for 1957.

After the English architect Evans, somewhere about 1900, had discovered and excavated the Minoic palace at Knossos, palaces have also been found at Phaistos and at Mallia. At Knossos, according to Greek myth, King Minos resided. A few years ago Marinatos tried to ascribe the two other palaces to Minos' brothers, Rhadamanthys and Sarpedon. Perhaps a fourth palace is to be found in the little town of Lykastos, because this name occurs as the name of one of the sons of Minos. In the course of an excavation in 1955 made by Marinatos and speaker, remains were discovered of a town dating to the Minoic period. A few more monumental remains could belong to the palace searched for, although complete certainty about this point was not attained. The wall of a fortress threw some doubt upon the theory that the Minoic Cretians, since they possessed a great fleet, needed no fortifications. This year Italian investigations, too, found for the first time, near one of the other palaces, a stone fortification.

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[3]) *Kreta en de mythologie*, J. B. Wolters, Groningen, 1956, (18 pp.).

More certainty about the political conditions of those days could be obtained if only we possessed historical writings of this people. A few years ago inscriptions on clay tablets have, indeed, been deciphered, dating to the last period of the palace of Knossos. The same writing was found on clay tablets and vessels of continental Greece. It comprises inventories of men and goods; historical texts are completely lacking, however. Nevertheless the tablets are very important, because they appeare to be written in Greek. This opens up perspectives about the balance of power in the Aegean Sea after the conquest of Crete by the Greeks about 1450 B.C. A reflection of this fact is seen, according to some, in the legend of Theseus' fight with the Minotaurus. About this time, too, the Philistines are believed to have emigrated from Crete (which is identified with Kaphtor in the Bible). Egyptian texts as well as a few names occuring in Greek mythology give rise to the question whether their country of origin is rather not to be found in S. E. Asia Minor.

The usual addresses concluded the oration.

REVIEW OF BOOKS

William Hendriksen, Exposition of I & II Thessalonians
(New Testament Commentary)
Baker Book House, Grand Rapids, 1955

The first thing to be said about this commentary is that it is an American book. It is American in the first place in as much as it is voluminous. To produce a volume of 214 pages on the seven small, not too complicated chapters of Thessalonians I & II means a two or three-volume book on Romans. American Bible students have no doubt more room and more money than their European colleagues. It is American secondly in respect to its bibliography: of the mass of German scientific commentaries only W. Bornemann (1894) is quoted and even Kittel, Theol. Wörterbuch z. N. Testament is missing, a lack that is certainly not compensated by quoting a lot of Dutch non-scientific and even non-exegetical literature. It is American in the third place because of its style. It could even be asked whether the author, speaking of an "amusing" exposition of the old Dutch "Statenbijbel" and adding literally: "We happen to own one of these heavy antique Bibles with covers of wood and hinges of brass" (p. 174) has not left scientific style behind him in a measure that is neither European nor American. One could even be inclined to state that the digression about the etymology of the proper name . . . Gregory (p. 125) is inappropriate even in a non-scientific commentary.

As to the contents it deserves full attention that the exegesis starts from the writers own continuous translation. Everybody concerned with exegesis knows that giving a continuous translation is the most difficult part of the job. So far as I, as a Dutchman, can judge this translation it is modern and moderately free, just as a modern translation should be. In I, 2 : 16 the insertion of the pronoun "We" makes Paul guilty of the things of which he accuses the Jews. An printer's error?

I can't help feeling very uncomfortable reading the author's exposition of II, 2 : 7: "he who now holds (him) back." According to the author we can safely say that the apostle viewed Roman government as a restraint upon evil. And, indeed, we can. We cannot, however, forget — as does the author — the fairly authoritative interpretation of O. Cullmann viewing the apostleship of Paul as the "katechoon" or "katechon". A thing we can certainly not do is to assert — as the author does (p. 182) that there is only a slight difference between his own opinion and the rejected of the restrainer as an "angel", because the dispositions of rulers are said in Dan. 10 : 13, 20 (in his opinion at least) "to be influenced by angels."

The main problem of the two letters is, materially speaking, their eschatology. It deserves appreciation that the author has kept himself as a thoroughly reformed expositor entirely free from the slogans which in such a measure are dominating modern eschatology. We can record it with gratitude.

H. M. MATTER

E. Leslie Carlson, A.M., Ph.D.: Elementary Hebrew
(Baker Book House, Grand Rapids 6, Michigan, 1956)

In his introduction the author observes: 'This textbook is an endeavour to simplify the study of the Hebrew language, and still to use the inductive method in a modified form. Twenty-three years of using this method in teaching Hebrew, careful study of all new textbooks using the deductive method, and experience with students previously taught by this latter method increase my faith in the superiority of a modified inductive method'.

According to this method the first fourteen chapters of Genesis are dealt with. There is much to attract in the method, and the manner in which it is applied by the author is accurate and clear. An objection to the method might be that the various grammatical questions are not discussed systematically. An advantage is that the pupil starts with the text of the Bible at once, and we should not forget that that to most learners of Hebrew the contents of the Old Testament will be known. The writer has given us a fine book, very useful in teaching Hebrew, and well produced.

W. H. GISPEN

SHORTER NOTICES

Elmer E. Flack, Bruce M. Metzger, and others, *The Text, Canon, and Principal versions of the Bible*. A Brief Survey of Recent Research extracted from the twentieth century Encyclopedia of religious knowledge.
Grand Rapids 6, Michigan, Baker Book House, 1956 (63 pp.).

In this book are issued several articles bearing on the subjects mentioned in the title. It is a very useful book for Seminaries and students of the Bible. The articles are in touch with the latest advances in theological learning. They set forth the main points and give up to date bibliographies. The publisher gave the booklet a fine strong cover.

William Goulooze, *Glory awaits me*. Memorial Edition.
Grand Rapids 6, Michigan, Baker Book House, 1956 (112 pp.).

The author of this book, a well-known minister of the Reformed Church in America, died on the fifth of September 1955. He has written the preface himself. Several times he was severely ill. In the preface he says: 'The third major experience of suffering began in December of 1953. I was told by the doctors at the Mayo Clinic that my case in the way of treatment was hopeless and that I could go home to prepare for the end. Experiences frought with emotion came as a result of this announcement. It seemed as though God directed me again to put down my thoughts in outline form and prepare to do more writing on suffering. The urge to write this particular volume came from the marvelous hope which God gave to my heart in terms of the glory which we now share and which awaits us for all eternity'.

So the meditations in this book give the message of a man who knows that he is rapidly approaching the end of his earthly sojourn. These very personal meditations are nevertheless based on the Scriptures.

Devotions and Prayers of Martin Luther. Selected and Translated by Dr Andrew Kosten.

Grand Rapids, Michigan, Baker Book House, 1956 (111 pp.).

This small and exquisite volume which can easily by carried in one's pocket, presents fifty-two one page devotions on the Psalms, and as many very brief prayers. The book is designed for people with too little time to read a long book. For this purpose it will be very helpful. The translator rightly observes in his Preface that all the chosen meditations are spiritual gems; rich in comfort, counsel and inspiration.

D. NAUTA.

The articles in this number of the Free University Quarterly were contributed by:

Professor Dr. W. H. Gispen.
Professor Gispen was born in 1900. He studied theology in the Free University and obtained his degree in 1928 on a thesis entitled: *Indirecte gegevens voor het bestaan van de Pentateuch in de Psalmen* (Indirect data for the existence of the Pentateuch in the Psalms). He is Professor Ordinarius in the Faculty of Literature and Philosophy since 1945 and is charged with the instruction of Biblical Archeology, Hebrew and Assyrian; he is also Professor Extraordinarius in the Theological Faculty, in which capacity he teaches the exegesis of the Old Testament.

Professor Dr. A. W. J. H. Hoitink.
Professor Hoitink was born in 1905. He studied medicine at the University of Utrecht and took his degree in 1934 on a thesis entitled: *Zijn er „kunstmatige sera" met een bijzonder gunstige werking bij bloedverlies?* (Are there 'artificial sera' with particularly favourable action in case of loss of blood?). From 1949 to 1952 he was professor in the University of Indonesia at Buitenzorg. In 1952 he was appointed Director of the Physiological Laboratory of the Free University with simultaneous instruction to teach physiology.

Professor Mr. S. Gerbrandy.
Professor Gerbrandy was born in 1914. He studied law in the Free University and obtained his degree on the thesis entitled: *Industrieel eigendom en subjectief recht* (Industrial property and subjective Law). On completing his studies he set up a practice as solicitor. In 1954 he was appointed Professor. He teaches Private Law.

Dr. H. Bianchi.
Dr. Bianchi was born in 1924. He studied law in the Free University and took his degree in 1956 on the thesis: *Position and subject matter of criminology.* In 1957 Dr. Bianchi was appointed Lecturer in criminology.

A limited number of offprints of the articles published in this issue of the Free University Quarterly are available on application to the Managing Editor.

MAN IN PHILOSOPHY

One of the themes that are the order of the day in modern philosophy is no doubt the theme: *Man in the world,* respectively *Man in the situation.* We come across it time and again in pragmatism, in the philosophy of life and—last but not least—in existential philosophy as an adage, a first datum, a slogan. And no wonder. For on closer study this theme appears to be fundamental for the whole manner of philoshophic speculation as it is advocated and practised by present-day irrationalist thinkers. Heidegger has formulated the fundamental significance of this theme for the whole of his philosophy as follows: "Die These (viz.: Zum Wesen von Dasein als solchem gehört das "In-der-Welt-sein") ist ursprünglich und einfach" ¹). Whereas in his opinion all our ideas are nothing but projections in which man-in-the-world transcends over the world and over himself, *this* idea is according to him no projection, no "Entwurf", no self-transcending idea, but, simple and original as it is, it is the idea which is the basic foundation of all existential—ontic and existential—ontological activity. It determines the place of man, also that of man's self-determination and world-design. It indicates the constant, unchangeable and immovable *frame* within which the human mode of being moves; it effectuates the possibility of the human mode of being including human culture as result and as activity. *Man is in the world;* this state of affairs cannot be changed in the least by any man, however much freedom constitutes the nucleus of his existence.

This means: the fact that man is in the world is a *transcendental* fundamental ²) idea of Heidegger's philosophy, also of his view of culture. It is the basic *dogma* of all his philosophic speculation; a dogma which has nothing behind it, which rests in itself, which is not supported by anything outside itself: an apriori beyond the possibility of discussion, at least *philosophic* discussion, since for Heidegger philo-

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¹) Vom Wesen des Grundes, p. 21.

²) For the meaning of "transcendental idea" see H. Dooyeweerd, *Transcendental Problem of Philosophic Thought,* Grand Rapids, Eerdmans, 1948.

sophic discussion is only made *possible* because man is in the world, and philosophic speculation is intrinsically bound up with man's being-in-the-world.

In Jaspers and Jean-Paul Sartre we meet with similar though not identical ideas.

In Jaspers, who is *inter alia* oriented on Wilhelm Dilthey's *"Problematik"*, this being-in-the-world of man is especially seen as a "being-in-situation", as being in an historical tradition and in a culturally and socially determined situation.

And in Sartre, who in his ontology attributes the nature of being exclusively to the non-typically human, and considers the human mode of being as a self-isolation of man, a reaction against existence as a kind of "throw-off", and thus as a *néantisation* (negation) of 'being', "un trou dans l'être", the theme of "man in the world" is primarily approached from corporeality to which human existence is at once intrinsically bound and intrinsically alien.

But however different in the manner they are worked out, also by being combined with other themes mutually diverging from one another, nevertheless the philosophic-anthropological conceptions of these thinkers severally and collectively prove to be dominated by the (more than) philosophic dogma, the transcendental idea of man-in-the-world, man-in-the-situation.

At the very outset we wish to state this emphatically, as in our opinion this axioma, this starting-point contains, calls up the idea of a crisis of culture, and once it has been called up it can no more be driven away.

Besides this first basic axioma modern existential thought knows a second *dogma* which like the first is of fundamental importance for philosophic speculation on man and human culture, and which is equally dogmatically put forward, at the very beginning, dominating the whole, as a thesis which speaks for itself and can claim universal validity. This second dogma stands in a polar relation of strain to the former, and together with the first it becomes in my opinion the "dialectic basic motif" of all existential philosophy.

This dogma enunciates the fundamental *distance* between man and everything that is non-human, their distinctness and separateness, the difference in nature between them which cannot be bridged over by something else.

With a view to this Heidegger calls man "*das Wesen der Ferne*". His being-in-the-world should not be seen in such a way that man is *enclosed* by this being-in-the-world. Nothing is less true. It is especially here that the idea of *transcendence* comes to the fore. Man transcends, outsteps himself, rises out above himself, goes beyond and outside himself. There is no existential philosopher but this idea of man's transcendance is of essential importance in answering the question: "Who is man?". Man transcends *himself* and as a consequence certainly his "being-in-the-world", and the manner in which he is in the world in the situation of the moment. Man is *en route,* is a "pilgrim", has a "Worauf-hin" (Heidegger), and this "telos", this eschatological horizon of the human mode of being causes man always to be "un-zu-hause", however he may be in the world.

Part of this "being authentic man" is to be faithful to this call of transcendence. And when this call is not obeyed, and a man "inner-weltlich" restricts himself to thoughtfulness, care and forethought with regard to the "intramundane", he lives in a state of decadence, that is essentially in self-estrangement, "uneigentlich". In such a case a man is in process of losing himself, denying himself, betraying himself, falling away from himself.

In Jasper's philosophy the world is the theatre, or also the arena of human activity. But not in such a way that the telos of man's activity is in this world. He is not in the world *in order to* be in the world, but he is in the world for something else, he is in it to stand aloof from it, and he finds his telos in the transcending, the world-transcending act of the experience of being, which cannot be brought about unless the world "disappears", becomes "transparent", and the "Vergewisserung" on the *Transcendent* befalls man in the tragic defeat.

And however highly Sartre may value the corporeality of man, this does not alter the fact that the "essence" of human existence is to Sartre an annihilation of being, an annihilation which also corporeality cannot escape. Moreover, also with Sartre the idea of transcendence renders the telos, the destiny of man. For Sartre, too, it is the central idea of the typically human existence. Only by way of annihilation of existence can a man be faithful to the call of transcendence, and this transcendence is nothing else, nothing less—or rather—nothing more than the useless passion of self-deification, of the conscious striving after an illusion whose character is clearly understood. An illusion and a striving, leaving the world of being behind them.

Man is distance, keeping distance, creating distance.

This fundamental idea is of decisive importance for the views of these thinkers on culture.

For culture, in so far as it is not considered as cultural activity, is always result, effect, product of a human, controlling formative power, guided by unhampered imagination, or in other words: led by a previous free design, by human counsel. As such it is characterized by the historical aspects of our reality. For the culture-forming power of man the natural becomes the material, the object shapable and to be shaped. Only under the aspect of a finality, an objective and consequently of a free design is man capable of acting creatively in the natural aspects of reality, and of creating culturally. Thus no house was ever built without previous human imagination, design, objective and subsequent shaping, formative activity.

In so far now as culture is not produced by ourselves, but as a result of precious activity by ourselves or by others, stands as it were before us, it belongs according to the basic view of the existential philosophers referred to, to the "world", in which man moves as existence. This means, it does not belong to us *intrinsically*, but is at most the situation, the tradition (Jaspers) in which we find ourselves existing, but which in principle we shall have to transcend so as not to become the victims of inner self-alienation by exterioration. Culture exists to be conquered. He who makes tradional culture his habitation, who is at home in it, lives essentially in a condition of decadence (Heidegger), has stumbled on the way to the Transcendent (Jaspers), has instead of the unprotectedness in the pursuit of the Illusion entrenched himself in false security and objectivities and is "de mauvaise foi" (Sartre).

Culture is a menace, a temptation, a snare to man rather than a gift, a boon, a service to him. We are to *warn* one another above all against culture. Since it is "past" ("Gewesenes", Heidegger), "tradition" (Jaspers), "facticité" (Sartre), it is a temptation to ensconce oneself in it, instead of keeping aloof from it and transcending it. It is there for us to move through rather than to use, to be *replaced* rather than to be accepted gratefully. It can only be appreciated as "pièce de résistance". As soon as man loses this original distance of his towards culture, he has come to belong to it and is alienated from himself.

Man-in-the-world, therefore, at the same time man menaced by the world, challenged by the world. Cultural man is the challenged man who is attacked, and if not, if he lives his life as cultural man and is absorbed by culture, he is lost, fallen away from himself. Cultural man can only hold his own as cultural man if he keeps transcending himself incessantly, and conquers his past, his tradition, his "facticité", i. e. conquers himself as man of definite culture.

There is no culture but it is there to be conquered. There is no culture but is a temptation to man to be "zu Hause" in it. The *revolutionary* attitude is the only *legitimate attitude* towards all existing *culture*. The conservative one is on the other hand radically wrong. Not so much because a certain culture might have its defects and deficiencies, which are not to be preserved, but only because fundamentally all culture has to be thrown into the crisis, and because the cultural crisis is the human call par excellence. Here one of two alternatives has to be faced: it is either man in the crisis and betray human nature, or culture in the crisis, and serve it. Man is amiss when in his opinion it is all well with culture, culture is at fault when it is all well with man.

This dialectic in the relation between man and culture will in its radical character become clearer still when we pay due consideration to the concepts of *freedom* and *contingency* in existential philosophy.

The *concept of freedom* links up this philosophy *inter alia* with idealistic philosophy, both that of Kant and the great German idealists (Hegel, Fichte, Schelling) and that of the Neo-Idealism of the Baden School (Rickert, Windelband).

When Immanuel Kant distinguishes theoretical and practical Vernunft, and sharply keeps the provinces of each of them apart, he wishes to give natural science its full rights, but in its own domain and its own boundaries. And he does this in order to accord a place to *faith*, faith, that is, in the rational and moral freedom of man, in the ethical autonomy of man. The domain of man's moral life of freedom ought not to be examined by scientific thought scientifically and should certainly not be under scientific control. This is not permissible and in his opinion it is impossible. Only "praktische Vernunft" rules supreme there, which is at all events not of a theoretical nature.

Fichte, in his philosophy of freedom, going beyond Kant, placed this belief in "practical Vernunft" foremost in his system; he leaves no place at all for a theoretical Vernunft independent of the rational, moral self-realization of man. "Das Ich setzt sich selbst *und* das Nicht-Ich". All reality is a creation of the praktische Vernunft, also the Nicht-Ich. It derives its meaning from the free, creative, self-realization of the moral personality, and its existence is justified as being the "material for duty". It is no pole with its own power and meaning overgainst the moral social subjectivity and its self-realization, for it finds its origin in the practical Vernunft, in the rational moral subjectivity of man, in "das Ich". Human *culture* is, therefore, in this idealistic philosophy entirely under the aegis of the moral selfrealization of man. With regard to its existence a crisis is out of the question. The creation of culture is justified and warranted as a manner of moral self-realization of man. In the philosophy of values of the Baden School, however, a radical change takes place, and a weakening of this rationalistic moralistic "humanity" concept, which explains reality wholly from human rational moral subjectivity and justifies it in its relevance to humanity and with reality also all cultural activities and results. Whereas in the old idealism human "Vernunft" was central and dominant, this is no longer the case in the philosophy of values. The "value" concept replaces the idea of Vernunft. "Reasonableness" is again forced back and entirely reserved for science and theoretical philosophy. But the a-theoretical Values of religion, art und morals are said to be values which can no longer lay claim to *truth*, since they are a-rational. The human imparting of sense, culture is a free creation of man. But this freedom is also, and particularly, being free from reason; Freedom is no longer rational and consequently the greater part of human culture is not rational either. Only philosophy and special sciences are rational culture still. In a gigantic struggle Rickert tries to save the theoretical purity, objectivity, efficiency, neutrality and the general validity of the theoretical value of Truth from the menace of the other a-theoretical values. Only the idea of a "splendid isolation" will bring a solution. But the price paid for it is very high indeed, since theory and practice, philosophy and life will henceforth intrinsically be perfect strangers to one another. The whole practice of life and also the whole of cultural life—the field of theoretical culture, that of science and philosophy excepted—occupies a free and independent position beside and often overagainst philosophic theoretical thought and that of the special sciences. The sense and meaning of the non-theoretical cultural areas is beyond all reasonableness and thereby also beyond the control and guidance of science.

The *philosophy of life* heralds an entirely different attitude. It will also deprive theoretical thought of its independence and accord science and philosophy a place in life, with Dilthey more particularly a place in spiritual life and subordinate and subservient to it.

Dilthey himself fought a lifelong struggle with regard to the question whether priority was due to the theoretical science of history, *historica* or to history itself. Inwardly in doubt he was often not able to accord priority to the one or the other, and his position was often one of 'given and take', or he fell into obvious circular reasoning. Historical conceptualization arises from historical life, although it should not be identified with it. Ultimately he had no doubt lost his heart to *historica,* and to theoretical historical reason, wherefore he may not improperly still be classed with the neo-positivists. But with all this nobody has contributed so much to the rise and domination of historicism as Dilthey has.

This means in the first place to the *relativism of science.* And just because in making scientific reason absolute, belief in human reason had as a last resource taken recourse to the Neo-Idealists such as Rickert and Windelband, the relativation of science in scientific philosophy means no less than the end of rationalism and the beginning of irrationalism. Of Kant's proud building of autonomous, objective, neutral Vernunft which he had declared to be of general validity, not a stone was on end, practical *Vernunft* having, moreover, been given another meaning: irrational praxis, life, the deed, the irrational cultural act and cultural creations. Reason, scientific reason first of all, had been dethroned. She had to put up with the humble position of handmaiden to a culture which, on having sprung from non-rational sources, authoritatively went its own way and forced its will upon philosophy and practical science to such an extent that theoretical thought was said never to be intrinsically capable of adequately forming value-free judgements rising *beyond the spirit of its own time.* The validity of the judgement of philosophy and special science was limited to the domain of culture and of the cultural period within which philosophic and scientific thought moved. Its validity was essentially "historisch beding" (conditioned historically). They were mere phenomena of culture and their validity reached no further than the phase of the cultural area to which they belonged. For Dilthey this "historisches Bewusstsein" was the royal road to man's self-deliverance, since—when necessary and desirable—he was now able, out of this 'historical consciousness' as being historical and *therefore* relative, to deprive everything that presented itself to man authoritatively, and with a claim to universal validity, of its authoritative power. And this was of immense significance.

For Dilthey had, as historicist, reduced the whole of human spiritual life, not least religion, to cultural phenomena. The key to "understanding" the totality of man he had placed into the hands of the historian, because he had historified the existence, the "essence" of man. Man *is* his history, *is* his culture. His culture is his being, his variable constant. Philosophic and religious selfknowledge of man coincided with an insight into his own cultural life and with cultural philosophy.

We stated already that for Dilthey himself this insight was in the first instance a deliverance, even to such an extent that with him there could be no question of a crisis of culture. On the contrary, culture was the be-all and the end-all.

But the destructive effects of this "culturism" were not slow to appear. The immanent teleology of "life", cultural life, did not know a single constant standard beyond life. If not in individualism—the philosophy of life is rather universalistic than individualistic—this had to end in complete subjectivism. For now that reason had been banished, the last norm to hold a position of independent superiority over human subjectivity, had to these 19th century thinkers been sent into the desert. Since then the problem of standards, man's sense of norms and his founding his consciousness on something else than on the complete subjectivity of man has become acute. *And with it culture and man's cultural activity turned adrift*. Here lies one of the roots of the present crisis of culture. If—as is the case in the philosophy of life, and as appears terrifyingly in Nietzsche's glorification of power, of the powerful deed, as a free human creation finding its justification in *itself* and in the increase of its power—if any human formative activity, having the power to win through and to come to domination, is by this very fact qualified as real culture, and the aim of cultural activity is merely held to be the increase of its power and its superiority, then an undisciplined culture, a bold, nay a daemonic culture can in no way be exposed any longer as inwardly antinomous and then we are, irretrievably and helplessly, in for a struggle for power which need no longer shun any weapon whatever. The idea of the self-justification of culture, which finds its right in its own existence, and in its own continuance and expansion its unlimited duty, can in principle be put on a level with the deepest crisis of culture, if not with the beginning of its undoing.

But where is help to be obtained if—as is the case with all historicism—in advance already, it is as dogma, as "historisches Bewusstsein" an established fact that science, morality, religion and the whole of man's spiritual life are themselves nothing else than culture, and accordingly "historisch bedingt" and that they are inwardly powerless and helpless against the course taken by any culture? For then they are themselves already on board the ship of culture and sail on it without being able to determine the route in the slightest degree. We do not steer, but are being steered, and only find limited scope for our activities, in the course of things, fixed without any act on our part. And a task which of inherent necessity must be serviceable to the trend of that culture.

If I see well, in historicism and especially in the historistical philosophy of life, the ideas of contingency and freedom are as good as synonymous. Freedom is contingent, and the contingent is free. Freedom is contingent, i. e. she is non-reasonable; her structure is not constant; she is her own possibility; she founds her own possibility, just as culture is private ground and has her own potentialities of power. Under the history-forming power and expansion of power of the free deed of culture no ground can be discovered for reason; apart from the free, and consequently rationally inperspicuous origin of human culture-creating action, she is purely fortuitous. Her "facticité" finds no other justification but in her "facticité": she *is* there; she *is power,* she confirms herself. Why? Just because, i. e. for no reason whatever! Just chance; contingent. That any culture, that the cultivation of sciences in Western Europe, that Western system of law, Western morality and customs, Western Christianity are as they are, is purely accidental. They might also have been quite different. And they would in that case be equally meaningful and as unjustifiably justified by their existence, their presence by their factual domination. The historically developed "form" of historical culture is purely contingent.

With equal justice, however, it can also be stated that *the contingent is free*. For in this historicism of culture the existing and ruling culture happens to find her glory in her unhampered potentialities of expansion. The rulers of a culture are in this under no commitments whatever and under no pledge to anybody or anything; *they have the power*. The power of culture is power of freedom, is sovereign power. The rulers of a culture are at liberty to mobilise law and morality, religion and art, the press and the army, man and community, and steer them in the direction of their own, sovereign pleasure. Here there is not even the idea of a crisis of culture, for here there is nothing else but the worship of the power of culture and the rulers of culture.

The contingent ruler, organizer, leader, culture-planner is man, free man. The contingent, the "facticité" is free, is sovereign.

It is but a step from historicism to nihilism, since the idea of contingency dominating in historicism is in itself already a nihilistic idea. To the historicist contingency has another meaning than, for instance, to Leibnitz. Leibnitz distinguished contingent truths and eternal rational truths, vérités de fait and vérités de raison. The vérités de fait could in their factuality not be explained from the vérités de raison, but this did not alter the fact that as "truths" they were more than "factuality", more than naked, brutal and bold factuality, as according to Leibnitz they at least possessed a "ratio sufficiens" for their factuality, a sufficient *ground*. This is, however, not so in historicism. There "contingency" means the same as "without ground", arbitrary, lawless, irrational. The contingent does not offer a single hold and has no inner meaning. In no way does it rise beyond its brutal presence, and has not a single explanation to offer for its existence. It might as well not have existed.

As soon, therefore, as this idea of the contingent begins to dominate in the idea of culture and in the philosophy of culture, irrationality forces its way into the idea of culture like a flood, and culture is experienced as being inundated, as it were, with lawlessness and steeped in it. Its "being" has no axiological, and—at bottom—no religious priority over its "non-being". The reason why this is so ominous for the conception of man and the self-picture he designs of himself is that historicism identifies man with his culture. A nihilistic anthropology then follows closely upon the heels of a nihilistic view of culture.

The only thing in this conception of culture and man still offering some ground to escape this total nihilism and relativism is the *idea of liberty, human skill and ingenuity,* human *power*. Being contingent, freedom may be as she is and accordingly identical with her historical situation; the historistic philosophy of life has on the other hand no less emphasized the *freedom* of the contingent, the *human* character of culture and history. The "situation", the "phase" and area of culture is liable to free human formative activity and a resultant of a human free act of power. Man is master, also of his situation, also of history, also of culture, and his rule is a creative one, for according to Dilthey this is the gain bestowed upon us in the "historisches Bewusstsein". With it he dominates, not only the future of culture, but he is also the "dominus", the creative ruler of his own future-being. Culture and man have a *free* future, and are as such unpredictable, undefinable, elusive, unknowable, surprising, ever new, endowed with the gift of eternal youth. Therein is the sense of man and culture. Freedom is creative freedom, being-man is being creator, culture is "Neu-Formung", "Neu-Gestaltung", self-creation of man. Nihilism and cult of freedom contend for supremacy in this historicism, and each of them wants to say the final word. The ground-less and sense-less contingent and grounding, sense-creating freedom *both* determine man as well as culture. In this idea of contingency there is always again the idea of the inanity of man and culture, the radical idea of culture is the crisis of man, whereas in principle this idea of freedom presents the self-adoration of man, and the glorification, nay deification of culture. Daemonization and deification: both are fully, in their entirety and radically present.

Inherent necessity makes it impossible in the long run for daemonization and deification to remain in a state of unstable equilibrium. Thus it is that in the view of culture of existential philosophy to-day we are confronted by a radical change in the mutual relationship between the ideas of contingency and freedom referred to above. It is true, the existential philosopher also subscribes to the basic principle of historicism: "Man is history". Nor is the existential philosopher averse from historifying all typically human life. In my opinion Sartre outbids historicism to a considerable extent by historifying also the organic being of man and making it in some way dependent on free human power of disposition and organizational activity.

But with all this, historicism in the existential version undergoes a qualitative transformation. For the existentialist introduces a division, a separation between cultural life and the human mode of being and assumes a fundamental inherent difference between the philosophy of culture and anthropological ontology (ontological anthropology) so that when the existentialist says that man is his (cultural) history, he only refers to an indirect identity and that he will strongly oppose the view that this identity judgement can be reversed, asserting that cultural history comprises the whole of man.

In the second place the ideas of contingency and freedom are quite familiar to and frequently used by existentialist as well as cultural historicist. But not in the same way and in the same sense. For the anthropological idea of freedom of the existentialist makes freedom an *inner* human mode of being and act of being which is not contained within culture, cultural life and the creation of power producing culture, but which has to be found *behind* it: the freedom of the inner *potentiality* of starting the work of forming culture. Not the cultural *work*, but creative imagination preceding the *execution* of cultural *work*, not as yet technical hand-operation of some material, but only playing as it were with material possibly to be formed in historical imagination, in the project, the "Entwurf", this is really *existential life* and the province of sovereign, human freedom.

The idea of contingency in its essence, on the other hand, is entirely reserved for historical culture, the being, the past, "the world". It is "facticité", "das Seiende", "das Dasein". Typical in this respect is e. g. Jaspers' idea of free philosophizing. According to him this is at bottom without object and without content. And that, because it is *free*. "Objective" culture, on the other hand, is purely contingent, deprived of freedom, controllable and an object of control. Culture no longer dominates, but the inner freedom of man *dominates* over culture.

In the fourth place the problems of existential philosophy are the combination: *Man in the world*. This being-in-the-world is the apparently impossible unity of freedom and contingency, impossible since it is subversive of man and world. Man, who is free and because of his freedom imparts sense and meaning to things, finds himself in a contingent and therefore "sense-disturbing", sense-destroying world. Sovereign man is placed in an essentially refractory, uncontrollable and unmanageable world. Freedom and contingency have become here the two repelling poles which mutually exclude one another, and human cultural work is the crisis of man as well as of culture. The crisis of man: his cultural work is an impossible task, a task which is bound to result in a fiasco, a failure, in defeat. For as soon as it is detached from the blood-warm, spontaneous inner free designing of man, the result will immediately be a merely contingent antipole against human free mode of being. Defence and resistance. *Congealed humanity*, which as such becomes a temptation to human self-realisation, to the inner act of freedom to *estrange from* itself and to escape into this created "culture", to be absorbed in this "world", have one's home there, to "provide", to live on what one has, to become bourgeois, to congeal, to curdle and to clot.

Culture is one half of the human mode of being and as such the least important. For man, the uncompleted and incompletable unity in the sense of the continuous and never to be completed *activity to unite* of the inner, significant act of freedom and contingent, inane "outside" world is equal to the *history* of this unifying activity, and as history of this activity he is inwardly as alien to its result as he is to non-human outward reality. He is not able to dominate over culture, or only in so far as in a revolutionary spirit he receives and transforms existing culture into an ever new activity of unification. And so in infinitum. Therefore this activity towards unification is a relationship of *tension*. Essentially man is on strained terms with all culture, because of his being-man and on account of the nature of the "outside" world, to which also all culture belongs. It is the relationship of tension between freedom and contingency, which cannot be conquered and by which culture can never be adequately incorporated into human existence. Man in the world: this means struggle, strife, tension, and alienism; it is: Freedom in contingency; fire in water! an antithesis which cannot pass into synthesis.

Existential philosophy is, in its way, a philosophy of crisis. In the first place it is a philosophy of the crisis of *man*, of human certainties, of man-in-the-world. As such it is best known, professed and attacked more than any other.

For existential philosophy wishes to be a call, wishes to call man back from every way in which he is in the world, also in the world of culture, and to point out to him that as soon as he sees himself as a man of culture and experiences and feels himself to be so, he is estranged from authentic humanity and has fallen into the unauthentic mode of being. The "immanent teleology" of the cultural man of Dilthey, who is to be completely identified with his past culture and his cultural creation, cultural immanent man is *defeated* man. Dilthey's historicism then only holds for "unauthentic" man who never gets down to true humanity and gets entangled in a false image and is deceived by it.

Such a man has fallen a prey to inanity.

But for the existential philosopher the same thing holds good of him who gives himself completely, heart and soul to cultural activity and seeks the meaning of his life in culture-creating activity.

This is the inevitable result of a radical change of interests with the existentialist. For him the question: How do we establish a satisfactory culture? is a question of secondary importance, even a *temptation*, which, indeed, he is not to try to avert by prayer—there is for such a belief in God no room with Jaspers, Heidegger or Sartre—but which he is to overcome from his own inner strength (in Jaspers' terminology:

"origin"). For the dominating question, the only interest known by the existential philosopher is: How do I form myself to be the new man? *Self-interest* is the religious dogma of the existentialist. The "self", seen as complete freedom and being released from every tie to the *contingent*.

As early as the nineteenth century the theme of the *self-estrangement* of man is repeatedly heard. Dilthey seeks the self-deliverance from self-estrangement as the "*historisches Bewusstsein*"; Feuerbach and Marx "preached" self-estrangement both as fruit and as root of the belief in God; Kierkegaard inveighs against "bourgeois" Christianity as self-estrangement from existential inwardness and "infinity dialectic" of the personality. And existential philosophy cannot be understood without this theme of the struggle against man's self-estrangement from the primary and dominant, thoroughly (ir)religious theme of man's self-interest.

In spite of all cultural *pessimism* there prevails among all existentialists an "unverfroren" optimistic faith in *man*. It belongs to the true worth of man that he can find no other ideal, no other destiny than in himself and in *self-cultivation*. The only true culture is the self-culture of man. A self-*cultivation* born and nourished from the *self-cult* of man. The "woraufhin" is himself, the "self" of man. Man stands in a certain relation to himself, and this relationship goes deeper than his relation to the "outside" world. "Man-in-the-world" is the man who stands in a certain relation to himself, before being in some relation in the world and to the world. He who forgets the latter or neglects it, takes from existentialism what distinguishes it from the philosophy of life. Human existence is transcendence, it means to transcend life and culture. And this is because existential philosophy professes a dynamic in the nucleus of human existence, a dynamic of man transcending *himself*. Man en route for his future self has the destiny, ontologically founded, of always transcending his own innerness and a fortiori of always transcending a certain activity to unite his own innerness with the outside world, in the direction towards his own future, to his own "more" self, as self-perfection.

In this self-perfection and self-culture man is inwardly and essentially interested. This self-perfection it is, and it alone, which is the eschatological telos of human existence. No existential philosophy but it handles this idea of self-transcendence as autonomous and "selbstherrliche" human activity creating human dignity as the last norm, as human destiny and as the central idea of anthropology. Human culture stands *behind* cultural history studied by the historian of culture. Human history stands *behind* the history studied by the historian. It stands *behind* it and *above* it; it proceeds as the inside of human existence, outside the external and outward "phases" of cultural history. At best it "meets" cultural history. Therefore the anthropologist is another than the historian, and the anthropological biographer another than the historiographer.

At the same time a shift has taken place in what is to form the object of interest and hereby cultural history is largely sucked dry and declared to be void of interest. Interesting in the sense of decisive is not culture, nor is it cultural history and cultural science. The interest lies in what is enacted *behind* culture and its history: the history of the human self-design, of the free internal human decisions, in the inner human area of existence that is before and outside culture. "Man as history" is man-at-a-distance from the world of culture, at a distance from his own "being-in-the-world"; it is man who transcends his own being-in-the-world, indeed himself, permanently, and who is en route to his own future *self*-being. As history he is precisely *not* "of" the world, and certainly not "for" the world, and in consequence by no means of or for the historian, but only of or for a philosophical anthropologist, not least for the philosophizing *psychiatrist*. The internal history of the creative, free shaping of his own self-image, his own self-project, is the real existential history of man. The behaviour, the attitude, the constitution and the history of it, the "Entscheidung", decision to adopt this attitude is the "essence" of human existence. Included, too, is the attitude and "decision" of free existence in respect of the "history" of the meeting of this self-projection with the—subordinate to it—activity of uniting existence and contingent situation, of man's own existence and his own contingent being-in-the-world which is in truth not that man is in the world, respectively that he is cultural man, but it is, indeed, that man's being-in-the-world is *in* man, in his "consciousness" (Sartre), in his "Entscheidungsmacht" (Jaspers); a potentiality of his inner selfbeing and power of being-himself (Jaspers); an "Existenzial" of the human mode of being (Heidegger). Not the being-in-the-world is the interesting thing, but the "being-in-man" of one's own being-in-the-world is the only object of interest. Objective cultural history and culture realization only touch the outward side of human existence. Culture is only an outward part, an externalization and therefore "an und für sich" extremely unimportant. Only in that this external human mode of being has been incorporated into man's inner being, in that culture has been *subjectivized* and has been "appropriated and embodied in his own mode of being" for the purpose of transcending and defeating this "contingent side", can a second or third rate place be assigned still to culture.

From this angle the average attitude of man is typified by existential philosophy as an attitude in defeat, as a phenomenon of decadence. For average man takes a lively interest in culture. His whole existence is "Sorge und Fürsorge", a "Besorgend und fürsorgend in-der-Welt-sein", and by this, by this pragmatic attitude to life he is so much pre-occupied that he "forgets" in his flight from himself, that he stands in relationship to himself, and has to be, not in the first place cultural man, but first of all man of self-perfection. He is, unfortunately, interested in culture, instead of the building up of his own inner personality, his own future free self, which transcends all culture, at most using it and rejecting it as a transition stage.

For the philosophy of culture and for the anthropology of existentialism nothing is so illuminating and decisive as its doctrine of *antithesis*. Nothing reveals so clearly and convincingly the religious character and foundation of existential philosophy as does this doctrine. The antithesis between authentic and unauthentic man, between Selbst-Sein and self-disloyalty, and correlated with it the doctrine of man in the state of decadence, man "de mauvaise foi". It is the antithesis between the man of the self-interest, which "disinterests" every other interest, and the man of culture-interest: interest in technè, technical and other sciences, morals, system of law, social welfare, religion. For all these domains—the existential philosopher uncritically accepts here the historification and relativation of total man, also of his religion, and morals, as was done by historicism—belong to the essentially relative spheres, since they are *outward* and historic-cultural. The religion of self-interest surpasses the whole of culture and makes it relative. And where this self-cult in this existentialist sense does not take place, a man must in the eyes of the existentialist in religious disloyalty have fallen away from himself, and given himself up to culture worship. He has become the prisoner of the power of culture, the deserter of freedom, the guilty slave of the contingent world. He is in the world, whereas the world is not in *him*. And he has silenced his conscience. He is the bourgeois man, the bourgeois prisoner of the society of which he is a member, of positive religion, to which he gave himself up without defence, of conventional ethics, which suffers public opinion to rule over him tyrannically. He has given up his own freedom to his own contingent situation. In other words *culture has become his crisis*, because he has refused *to be the crisis of culture himself*. Culture is his narcotic, because he refused, awake and vigilant at the altar of self-cult, to be interested only in his own future self and his own self-image. He is estanged from himself and, so far as this is possible, has deprived himself of himself.

In the meantime existential philosophy holds to the idea that man, also free man, the man of self-culture and of the self-project, somehow depends on the contingent world, in which he moves as "outside" world.

Man *is* in the world, and however much this *being-in-the-world* is itself contained in man and as such becomes innerness, nevertheless the existential philosopher with dialectic consistency at the same time fully upholds the independent function of "outside world", „situation", "culture" and non-human mode of being.

Thus with Sartre contingent reality is the only being; the human, subjective pole of freedom, on the other hand, "le néant" and the self-realization of man can in his opinion only be accomplished as annihilation. Man is a hole in being and has his home in being. With Jaspers the self-transcendence of man in the direction towards the Trancendent cannot take place but in the world, and that particularly in the historical cultural world in which man is "hic et nunc". Without tradition no self-transcendence. And with Heidegger (in "Sein und Zeit) man, conscious of his freedom-to-death, returns to the reality of the Being, to be occupied in it" sorgend und besorgend", albeit also with the knowledge that this cultural activity is only of a relative value and ultimately immaterial, so that a boundless tolerance with regard to events *in* the world characterizes *'authentic'* man.

The way of self-transcendence runs right across culture, its heritage and its new creations. Thus authentic man is at the same time both the crisis of culture and the man who shapes culture, the guardian of the patrimony of culture (Jaspers) and the man who in his inner nature keeps aloof from it, identical with his body and corporeality (Sartre) and distinct from it, inclined towards the world and to culture and inwardly free from it. With Heidegger this ambivalent relationship is then more specifically heroic-tragic, with Jaspers patient-tragic, with Sartre illusionistic-tragic. The oneness of being-in-the-world and of the being-in-man of his being-in-the-world is a oneness of an infinitely tragic endeavour, in which man on the one hand in full freedom determines his own destiny and future, and on the other is as it were fettered to the cultural situation.

If culture does not become his crisis, he becomes thanks to his inner existential freedom the crisis of culture. And, even if Heidegger may with some justice be said to be the grave-digger of West European culture, it cannot be denied that Heidegger's nihilistic doctrine of death lives by the grace of the human act of culture: an act digging, indeed, the grave of all culture, but being itself accomplished again as *deed of culture*. Even as the crisis of culture, man is and remains "doomed" to be cultural man, and as "being-in-the-world" to transcend himself. As soon as this "being-in-the-world" disappears entirely, all human existence vanishes. The ideal of selftranscendence and culture-transcendance is an unattainable ideal, and, when reached is also the end of human existence (Jaspers). In order that the "being-in-the-world" shall be *in* man, it is necessary that man should be in the world. Here we can hear as it were Nietzsche's: "Brüder, seid der Erde treu" sound through the whole of existential philosophy.

And yet, the only real danger menacing this philosophy, comes indirectly from culture. Culture may become the crisis, nay the grave of man. And for the average man culture, his technical skill, his religion, his morals, his political life, his art-life, his being pragmatically occupied with the cares of life, are indeed nothing else but his grave.

Existential philosophy has set itself the task of waking cultural man from this death. It wishes to be a call, nothing less, and never fails to add: "He who has ears to hear, let him hear".

Whatever results from this philosophy, it certainly is not a *joy* in human cultural work. No joy in labour. No delight in technical skill or in science. Existential philosophers are rather cultural desperadoes (Beerling). Their "doctrine of life" does not reach its goal so long as culture is not distrusted as a temptation and a menace, an attempt on humanity, and so long as man does not set himself the task of being the crisis of culture himself.

This is the only note of optimism in this view of man and culture. Fortunately man *can* be the crisis of culture. He can be *in* the world, not of the world. Let him be it. Let him "stand fast in liberty" above the contingent "Umwelt", from which he cannot detach himself. And let him teach himself and others, only to be himself, only to take an interest in his own realization of this "being himself", and to keep culture, also his own cultural work inwardly at a distance. Let him keep his heart for himself and himself alone. As Dr. Smit has rightly observed, existential philosophy is at bottom anti-historistic and therefore also anti-cultural.

Now in this respect the very existence of culture is menaced, for this modern, radically subjectivistic self-cult of man, which considers the designing of man's self-image, which always transcends all concrete culture, to be the only true human cultural task, undermines and weakens the religious bond and ties of man to culture and to the cultural task. This modern form of self-centralization of man leads to a self-violation, a "self-scorching" of man and thus to a crisis of culture. For the ontology of existentialist philosophy has violated the *religious* totalitarian view of man and the world, because the being of the being is with the existentialists a mere word, being as it is no longer knows a religious significant unity between the being of man and the being of the world. Free existence and contingent world reality break up and are intrinsically alien and hostile to one another. In the existentialist idea of freedom man binds himself to himself, and this to the detriment of the world in which he lives. Man's function of freedom has completely been made absolute here. Near this idol true culture cannot bloom. And cultural *service,* the call to work do not thrive here. At best the cultural work of cultural life can be appreciated here as a necessary evil and as a regrettably unavoidable, although not understandable, contingent and tragic means to an end which makes this culture and the historical existence of man relative and undoes it. This is bound to happen because it is inevitable that when man places himself in the centre as object of cult and worship, the religious totalitarian view should be marred and the result is a gulf which can only exist by the grace of the breaking up of human existence into dialectically opposite poles.

The last century has been called a century without God. Although fully aware of the danger there is of concluding this essay by giving the appearance of "exploiting" God as a Deus ex machina, I cannot but see this menace to the serious and joyful surrender of man to tradition and his own cultural work as the inevitable consequence of the process of saecularisation that made the glory of man immanent to man and overrated it to such an extent that no room was left for God any longer, for His creation, His guidance and His redemption. He who makes God superfluous, makes himself impossible, for he prevents himself in theory and practice from leaving man and the world in their proper place. In a unity given by God and maintained by Him, a unity of man and the world, of personal life-story and cultural history of mankind, he makes it impossible for himself to find his own task and vocation not in himself, but in the God Who placed man in the world in order that in loving service he might employ his own historic freedom in the execution of a cultural task which not only makes it worth while to work and to plan, but also causes it to be an inexpressible punishment, particularly for human nature, to be cast loose from his cultural vocation or sentenced to an intrinsically inane task in life. The self-interest of man is fatal to all joy of work. The true service of God, on the other hand, is the only source of a "labour service" in which faith, hope and charity grant peace on earth to man and the world.

S. U. ZUIDEMA

THE NATURE OF HUMAN GEOGRAPHY IN THE LIGHT OF THE ORDINANCES OF CREATION

I. *Scripture and the determination of human geography*

When speaking of the nature of human geography in the light of the ordinances of creation, we mean that we wish to penetrate to the core, the deeper meaning of this science by considering it and the phenomena belonging to its province in the light of creation and its ordinances as they have come down to us through special revelation in Holy Scripture.

Two pre-suppositions underlie this line of reasoning: that it will first of all have to be determined what human geography is and that this is done without Scripture from the conceptions designed by the science of geography in the course of its development, and that after this, but really simultaneously with it, these conceptions are tested in our minds by the views we have obtained from Holy Writ, which views are applicable to the phenomena of human geography. This means: The Bible does not tell us what human geography is; but if we have a clear idea of what is meant by it, Scripture can make us understand the deeper meaning of this science.

These propositions may in our opinion be based on the views on science held by Abraham Kuyper. It is necessary, therefore, to give a short summary here of Kuyper's thoughts. For the purpose we shall use his study on science in his work: Common Grace [1]).

Kuyper says: "Science belongs to creation and the nature of all human science is founded on three data which fit into each other. Firstly: In God there is from eternity His full, rich clarity of thoughts. Secondly: In creation God has revealed, expressed and embodied a rich fullness of His thoughts. And thirdly: In man, as His image-bearer, God created the power to understand, to catch, re-think this thought, which found expression in creation, and frame it into one whole. The first man had received this power in his nature, i. e. by virtue of his creation, and not by super-natural grace"[2]).

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[1]) Vol. III, fourth edition, reprint, Kampen, n.d., pp. 487—528.

By the sin of the first human couple earthly creation was cursed and damaged and the power of man to understand the creation was disturbed by the darkening of his mind. But general revelation, coming to all men, by means of ,,common grace" which comprises the whole of earthly creation, checks the outburst and full effect of sin. By this ,,common grace" science is possible. But to understand again the deeper meaning of science, to grasp again the true composition of the whole of things in their original connexion with God the special revelation of Scripture is needed. This special revelation only comes to him who lives under the Gospel. It is true that this gospel has come to us because there is particular grace, but Scripture does not contain particular grace only, it does not only show us the way to salvation. Scripture also gives us an insight into the origin, the aim and the final destination of all things, and an insight into the profoundest problems of life. "So what takes place here is a strengthening of the light of common grace coming to us from special revelation". Kuyper speaks about the special revelation in Scripture and "of the condition of the subject living out of that renewal of our spirit which only radical regeneration brings us". These two are indissolubly connected. For it is not only a question of Scripture, but also of what is necessary for a true understanding of Scripture. "Scripture alone cannot bring us any further. Just because it is not of the world, but by God's grace its contents have been brought into the world, it can neither be grasped nor understood, unless he who hears it, is also personally touched and illuminated by the spirit of God. The activity of God's Spirit in the inquiring subject must go together here with the objective activity of the Spirit in special revelation"[3]).

On these views of Kuyper we base our conviction that the science of geography, working in a definite field and occupying itself with a definite aspect of earthly reality, is possible thanks to "common grace" and has its foundation in this "common grace". But also that geography as a Christian science has at the same time its foundation in the special revelation of Holy Scripture, which makes its light shine into common grace to strengthen it. This is the reason why we define the object of geography and of human geography by starting from the conceptions designed by the science of geography in the course of its development and in connexion with the relationship of geography to other sciences and at the same time we place as Christian students this science and the phenomena it investigates in the light of the pronouncements of Scripture bearing upon them, in order to understand the meaning and the essential character of this science.

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[2]) Op. cit. 1, pp. 488, 492.
[3]) Op. cit. 1, pp. 497, 499, 514—516.

II. *Geography and Human geography*

Although the views about geography and its object held in the course of centuries from antiquity down to the present day vary and also the opinions in one and the same period display contrasts, it may nevertheless be said that one key-tone is unmistakably to be heard through all these divergent views. It may briefly be defined as the areal diversity of the earthly phenomena. Geography in the widest sense is the science of countries and peoples, of areas and areal human groups. We can only speak of countries and peoples, if one country is distinguished from another country and one people differs from another. If this were not the case, there could only be question of one country, one uniform surface of the earth and of one people, one uniform family. The earth's surface and humanity, however, display great areal differences and geography endeavours to find this areal diversity. It cannot be denied that views on geography are often highly divergent, but still in the main this divergence has its starting-point in a difference of accent, emphasis being either laid on the diversity between the countries or on the diversity of the peoples and areal human groups. Consciously and unconsciously, however, there is always the idea of areal diversity that comes to the fore. We need only think of the views of the Utrecht school, which finds geography determined in the phenomena resulting from the relation of man to nature, and emphasizing therein active man. The theoretical exposition and the practical execution of the above-mentioned school shows clearly that it is a question here of the areal diversity of the various phenomena, which phenomena arise from the relation of man to nature.

The areal diversity, the areal differentiation of the earthly phenomena causes every differentiation of a phenomenon to have a certain areal extension, shape and location. We say a *certain* areal extension, because many areal differentiations of a phenomenon gradually blend into each other. Moreover, every differentiation is dependent on the standards that are applied with regard to the diversity. With these standards we not only refer to the greater or smaller degree of subtlety in distinguishing the differentiations, but also and particularly to the distinguishing of the differentiations which depends on the insight of the inquiring subject into the nature of the areal diversity. Areal diversity is not given in earthly reality as such. It is determined by what we wish to distinguish and by our insight into the importance of the different elements of a phenomenon for areal diversity.

Climate may be distinguished into different areal climates, but according as the humidity or the temperature is considered to be of primary importance we shall obtain a different classification of climate, of which the areal extension, too, is different. This is due to the fact that the elements humidity and temperature, although influencing each other, do not areally vary equally.

Although, therefore, all kinds of problems present themselves in determining areal diversity, which we shall not discuss here further, the areally differentiated phenomena have areal extension, form and location they form areas and regions: areas of climate, areas of vegetation, cultural areas etc.These areas are, therefore, not given beforehand, but are determined according to the areal extension of the areal differentiations of the phenomena. Now geography tries to establish the interconnection of the totality of the areal differentiations of the various phenomena, such as climate, soil, vegetation, culture, economic life, etc. A geographic area is consequently an areal totality of integrated differentiations of the phenomena of nature and culture which is distinguished from another area which is an areal totality of *different* integrated differentiations of the phenomena of nature and culture.

The integration of the areally differentiated phenomena is very different, however. The importance of the areal differentiation of the amount of humidity and heat is different for the areal differentiation of natural vegetation than for that of the soils and for that of the cultivated crops. Areal differentiations of physical phenomena which are of importance for the areal differentiation of land use are mostly without significance for the areal differentiation of political phenomena.

The determination of the area is dependent, therefore, on the differentiated phenomena which serve as nucleus, which are taken as the startingpoint and with which other differentiated phenomena are associated as influences. Together they form an areal totality, a geographic area. Since the phenomena, although they are in many ways, causally, conditionally, and functionally interconnected as a rule do not areally vary equally, and the several integrated differentiations therefore generally do not have the same areal extension, there are in an area several geographic areas that do not coincide entirely, but overlap.

A geographic area is, therefore, determined by a *central* differentiation and some other differentiations which are significant for this nucleus. The areal extension of these integrated differentiations determines the size, the shape and the limitation of a geographic area. A geographic area is an areal unity of a totality of *fixed* areally differentiated phenomena. An economic geographic area is formed by an areal economic differentiation which functions as a centre, with which other areal differentiations that are of importance for this nucleus are associated. A pastoral, stockfarming area e. g. is formed out of the integration and areal extension of the pastoral farms with the specific features of soil, climate, vegetation and level of the soil water and the specific assets of cultural and social life in that area.

The geographic totality is, therefore, complicated and may be divided into various unities of geographic totality: the physical geographic totality; the botanical geographic totality; the climatological geographic totality; the social geographic totality; the political geographic totality; the economic geographical totality; the cultural geographical totality and a few more geographic unities of totality. On the basis of these different unities of geographic totality the science of geography may be divided into physical geography; botanical geography; cultural geography; economic geography, etc.

Every geographic science examines the areal diversity of the earth's surface with regard to its specific unity of geographic totality and divides the eartht's surface into distinct areas and regions. Economic geography forms economic geographic areas; political geography determines political geographic areas; and physical geography forms physical geographic areas, the integration of which is different on the strength of a difference in geographic totality. Since these different unities of geographic totality will areally vary unequally as a rule, the economic geographic areas, the political geographic areas and the physical geographic areas will generally not coincide [4]).

Human geography comprises social, political, economic and cultural geography. It forms a unity on the strength of the unity of human phenomena the geographic aspect of which it examines. But this unity at the same time shows a divergence based on an analysis of the human phenomena in social, political, economic, cultural and other human phenomena. This divergence results in geography in corresponding unities of geographic totality.

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[4]) Cf. G. de Jong, *Het karakter van de geografische totaliteit*, Groningen, 1955, pp. 13—39. See also G. de Jong, *Denkvormen van het geografisch gebied in eenheid en verscheidenheid*. Oration, Groningen, 1955.

Human geography deals with phenomena of man, but in a manner quite different from that of the other human sciences. The former examines the areal differentiation of human phenomena in connexion with the areal differentiation of nature. The aspect of areal differentiation is essential with regard to the problem which phenomena pertaining to man and nature are or are not of importance. Human phenomena which in broad outline are equal everywhere on earth and which are very important for the general and systematic human sciences, are of no importance geographically. Physical phenomena, which are highly important for human life and human culture in general and as such, but the areal differentiation of which has no effect for the areal differentiation of human culture and human life, are mostly of little significance for human geography.

The problem is not: What are the most important phenomena of an area in general, that means which are of the greatest importance for all areas. If this is the case, one is inclined to think that the ground is the most important element of the geopraphic area[5]): Man lives on and subsists on the ground and moves on it. The ground and soil are the most essential elements of an area as living-space. Even in the case that the raw materials necessary for production, the capital goods and the consumer goods are imported from other areas, life is only possible by the aid of one's own ground as the space where we settle, work, live and move. The climate is equally important as well. Without the atmosphere it is impossible to live.

But this argument leads us astray, for its startingpoint is: What is the most essential element that all areas have in common as living-space? This is not the geographic aspect. Geography asks: What is the most important thing for the areal diversity of the living-space? From this angle it is open to doubt whether ground and soil and climate have the greatest significance at all times and everywhere. Let us take a sea-clay area and an adjoining fen-peat district, both of them containing pastoral farms with co-operative dairy factories. The organisation and size of the business, stables, barns and sheds show great similarity. Draining and soil waterlevel are co-ordinated. The differentiation of the soil into clay and fen-peat is not decisive here and does not form two distinct economic geographic areas. The similarity of the business and culture, together with the same vegetation determines one economic geographic area.

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[5]) G. de Jong, *Geografisch verschijnsel en geografisch gebied.* Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap, 1956, pp. 154, 155 ff.

Conversely, a dissimilarity in economic life, in business, culture and technique on one and the same soil forms two economic geographic areas, just as one large sea-clay area, one part of which is used for arable farming and the other part for pastoral farming, forms two economic geograhic areas.

The principle of areal diversity is decisive also in another respect. It is only possible to determine a definite area in its specific nature by the aid of a knowledge of the specific features of other areas from which the former area is distinguished. In order to be able to determine a definite areal differentiation some insight is necessary into the areal diversity as a whole. This becomes the more urgent since every human geographic area is no independent differentiation existing quite apart, isolated from other areas, but every area is to a greater or smaller extent part of a whole and connected with other areas by horizontal relations [6]).

Human geography deals with a totality of areally differentiated phenomena of nature and culture, in which definite areal differentiations of human phenomena: economic, political, social or cultural phenomena form the nucleus. The character of this nucleus also determines the nature of the influence of the other differentiations on this nucleus. These central differentiations are for a large part associated with values, cultural values. At first we thought that the nature and the norm of human geography had to be determined from the nature of human phenomena as such [7]). But this reasoning leads us astray. For the essential character of human geography is not that it is concerned with social, economic, political and cultural phenomena as such, but that it examines these phenomena in relation to areal differentiation. The true meaning and nature of human geography must be founded in the *areal diversity* of human phenomena, and not in these phenomena as such and in general.

In order to determine this essential character we wish to consider creation and its ordinances as they are described in Scripture, more fully with regard to the areal diversity of the earth.

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[6]) G. de Jong, *De geografische classificatie van het klimaat en Thornthwaite's klimaatsystemen.* Tijdschrift voor economische en sociale geografie, 1957, pp. 20, 21, 28, 29.

[7]) Op. cit. 5, p. 161.

III. *Creation and its ordinances in connexion with areal diversity*

The account of the creation in Genesis scarcely speaks about areal diversity, but about the creation of the earth as a whole and of the creation of the great individual physical phenomena as a whole: the atmosphere, the land area and the seas as a whole. Scripture is more explicit about the animal and vegetable world. It is made quite clear that from the very beginning a genetic diversity has been created. In how far this genetic diversity at the same time meant an areal diversity and how the two were correlated, is not stated in divine revelation. But that in broad outline an areal diversity had been created is obvious, since the difference of land and water with their different vegetation and fauna meant an areal diversity.

Indirectly we may conclude from the story of the creation that an areal diversity in the physical phenomena of the earth's surface as a consequential phenomenon was bound to come into existence at once, since the creation of the "lights in the firmament of the heaven to divide the day from the night . . . and let them be for signs, and for seasons, and for days, and years" etc., points indirectly to an areal diversity in climate. Especially if we do not only connect these "fixed times" (as is the rendering of the Dutch Authorized Version) with the phases of the moon, but also understand them as seasons [8]). Days point to the daily movement of the earth round its axis. But owing to the spherical shape of the earth there is a difference in the angle of incidence of the rays of heat and light from the sun and with it a difference in the quantity of heat received by places of different geographic latitudes. Seasons point to a division of the year into natural periods, to a difference in light and heat at different times of the year. They are a consequence of the position of the earth's axis in respect of the plane of the orbit of the earth or ecliptic. This position is not perpendicular, but shows an angle of 66½ degrees so that the equator makes an angle of 23½ degrees with the ecliptic. In consequence of this and because the earth's axis during the annual rotation round the sun maintains the same direction, the seasons are produced, which differ areally in dependence on the geographic latitude[9]. This areal diversity of the solar climate is strengthened by the contrast of land and sea, and by the position of the land in respect of the sea. With the contrast of land and water the areal diversity in heat creates an areal diversity in moisture, although the areal distribution of heat and moisture does not coincide. Diversity of climate causes an areal diversity in the corrosion of rock and of the soil and of the natural vegetation and fauna. From this the conclusion may be drawn that at the time human groups should spread over the earth's surface there would exist a great areal diversity in the physical world and in the animal and the vegetable kingdom.

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[8]) G. Ch. Aalders, *De goddelijke openbaring in de eerste drie hoofdstukken van Genesis*, Kampen, 1932, pp. 277, 278.

What does the story of the creation teach us with regard to man and his areal diversity? In contradistinction to the animal and vegetable world the Bible speaks of one man and one human couple. This human couple, created by God, He places in a garden and He gives them the instruction: Be fruitful and multiply; replenish the earth and subdue it[10].

What is the meaning of this ordinance of creation in connexion with areal diversity?

The garden in Eden, where the first human couple lived and which people had to "dress and to keep", had been planted by God Himself. This region had been directly prepared by God as the abode for the first human couple. But, if the race of man should spread over the earth's surface in the course of centuries, the human groups would settle in regions which were mutually different and which were unlike the garden in Eden from which they had emigrated. However, these regions would not be territories strange and unknown to human groups. For all territories, however different mutually and unlike the region of Eden, had this in common with Eden that, besides being an areal differentiation of the earth's surface, they were also a perfect reflexion of the earth's surface as a whole. All areas had this in common with Eden that they consisted of earthly ground and soils, that they had an earthly climate and earthly vegetation and fauna. That was how the earth had been created and that is how the earth would be when human groups should settle in the various regions. And how had human beings been created? God created them in His image and likeness. But materially they corresponded with earth, for God had formed man "of the dust of the ground". Man's constitution was, therefore, adapted to the earth and had been created in such a manner that it had the power to vary within its genetic unity in conformity to the demands imposed by the areal diversity of the physical character of the eartht's surface. God had given to men the properties necessary for carrying out the divine instruction: to multiply and replenish the earth and subdue it. For this purpose God had blessed them. He gave them fruitfulness and domination and bestowed on them His favour and grace, which would certainly make them successful in the execution of their task [11]).

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[9] Areal diversity is discussed here only in so far as the Biblical account of the creation points to it directly or indirectly. For this reason we do refer to the solar climate, but not to mountains, although the latter are of great importance for areal diversity, also for the areal differentiation of climate. Genesis 1 only speaks about the acts of creation in broad outline, and merely mentions the creation of land and seas, among other things as a contrast between high and low; but it does not inform us about the vertical formations of the land itself.

After the fall of man the climate has undergone a change for the worse. This may have been caused by various influences of a tellurian and cosmic nature. Thanks to common grace an improvement set in after the deluge. By this change of the climate as a whole the areal diversity of the climate too, has changed, but this areal diversity has never ceased. On the contrary, it rather has increased, but has at the same time absorbed the contrast of favourable and unfavourable climatic areas.

[10] Cf. Gen. 1 : 27, 28 and for the following discussion Gen. 2 : 8, 7, 21—23.

Seen in this light we can understand the meaning of the ordinances of creation with regard to areal diversity. Mankind was to cultivate the richness of the areal diversity of physical earth and develop it into a richness of areal diversity of material culture by a passive and active adaptation to this areal diversity of the earth's surface. And the human race, being the highest creature created in God's image, through this active and passive adaptation would, moreover, develop an areal diversity of spiritual culture. A diversity which was at the same time a unity, because of the unity of the human race and the unity of the areas, each area forming a reflexion of the earth's surface as a whole [12]).

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[11]) *Theologisches Wörterbuch zum neuen Testament*, Hrsg. von Gerhard Kittel, II, 1935, p. 754: Der Segen Jahwes ist vielmehr die in souveräner Freiheit gespendete Gnadengabe Gottes mit der Er einzelnen oder einem Volke seine Gunst zuwendet und ihnen das Werk ihrer Hände gelingen lässt, Deut. 28 : 12; Ps. 89 : 17. Das erste was Gott mit ihm tut, ist, dass Er ihn segnet, Gen. 1 : 28. Die ihm gespendeten Gaben sind Fruchtbarkeit und Herrschaft (article by W. Beyer).

[12]) Only the *areal* aspect of nature and culture is discussed here, just as we only consider the ordinances of creation with respect to areal diversity.

The sin of the first human couple almost immediately disturbed the execution of the command laid upon them. Scripture speaks of a corruption of man and of the earth [13]), which came to an end in the Deluge.

But afterwards it was general grace, common grace, comprising the whole of earthly creation, which made it possible again to develop nature and culture. In the covenant with Noah, a man with his sons received again a blessing and a command. The command given to the first human couple was repeated: Be fruitful and multiply and replenish the earth. In connection with the curse resting on the creation, the blessing was extended with the promise that God would not again curse the earth any more, as He had done and that henceforth while the earth remained seedtime and harvest, and cold and heat, and summer and winter, and day and night, should not cease.

The consequences of man's sin and the curse, although they were restrained by common grace, continued to take effect, however. This appears from man's opposing the divine command. The human groups would not migrate, but continue to live together in one area, in the country of Shinar. The people formed one nation with one language and they built a city and a tower. On the part of the human race the unity, which contained a diversity, was developed in a one-sided manner by changing this unity into monotonous, rigid similarity. This was at variance with the character of human nature and the diversity of the earth surface as God had created them and was contrary to the command that had been imposed upon man. A command which was in harmony with his disposition and talents and with the nature of the earth's surface.

Then God confounds the language and compels the human race to spread over the earth and to develop the areal diversity of nature and culture.

But God's common grace comprising earthly creation does not allow the unity of the human race to be lost. In process of time the unity was recovered once more from areal diversity by the power which men possess and develop to understand one another's language.By this the recovery of unity from areal diversity was not only made possible, but also imperative. For just as unity hardening into monotonous similarity and uniformity means impoverishment, this is also the case with a diversity which leads to isolated countries and peoples existing or living apart, separated from each other. The richness of creation can only be brought out fully, if unity and diversity are developed in harmony. For both unity and areal diversity were contained in creation, in that of the earth as well as in that of man.

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[13]) Gen. 3 : 16—19 and for the following discussion Gen. 8 : 21, 22; 9 : 1—17; 11 : 1—9.

If we see areal diversity as a unity, the command of creation: replenish and subdue the earth is an ordinance which not only holds for the human race as a whole, but also for every group of men in its area. Every people with its country has its own specific character and by its contact with other peoples and countries such a country and people can participate and ought to participate in the diversity of the other peoples and countries. Every people replenishes, subdues and cultivates the earth as a whole by participating in the whole of the areal diversity of earthly nature and culture.

IV. *The meaning of human geography in the light of the ordinances of creation*

Having tried in the foregoing to understand the meaning of the ordinances of creation in connexion with areal diversity, we will now by the aid of the results of this investigation determine more precisely the meaning and the norm of human geography.

Human geography studies the areal diversity of human phenomena in connexion with the areal diversity of the phenomena of nature in a definite period of time. In the light of the foregoing, therefore, the diversity of the human geographic areas and regions must be taken as a unity. Every human geographic area or region is a totality of areally differentiated human phenomena in connexion with areally differentiated phenomena of nature. Every human geographic area is a part of the whole of the human geographic areas and has some function within the whole of this areal diversity.

The problem of human geography is: In what manner does every area function in the whole of areas, i. e. of what significance is one area to another and what significance do the latter have for the former? This is the essential point in human geography and forms its teleological principle, which has the character of an areal functional finality: the participation and orientation of one human geographic area in and towards the whole of the human geographic areas and the participation and orientation of the whole of the human geographic areas in and towards each separate human geographic area. This principle of areal functional finality at the same time determines the norm of human geography: the more this areal functional teleoloy is present in a human geographic area, the more this human geographic area or region will answer its purpose which is founded in the ordinances of creation. This diversity which has come to form a unity, shows the combination of the parts to and within a whole. The function of each area can have full play then, if its own specific qualities are fully developed so that this human geographic area can really give a share of its specific assets of nature and culture to other human geographic areas. In their turn the other human geographic areas share out to the former and this area works up again what it has received in natural and cultural products from those areas, into new and specific cultural possessions of its own. There is in such a case no question of taking over such products, but of assimilating and sharing out again. Every human group in its area replenishes and subdues the earth as a whole.

Areal teleology is founded in creation. It is the leading and forming energy, dominating the forces of the separate areas and directing these forces to the whole of the areas. By this areal finality areal diversity is combined to a unity and to a whole. Areal finality manifests itself not only in the human geographic phenomena, but also in the physical geographic phenomena. In the latter the areal finality is limited, however, and only has the character of "Zweckmässigkeit", as in atmospheric circulation, the sea currents and rivers: Through the winds an interchange takes place of heat and moisture between the various areas, so that the different climatic areas are combined into a system and become interconnected within the earthly climate as a whole. Winds, sea currents and rivers carry particles of the soil from one area to another, so that the grounds and soils of the various areas are integrated. In the human geographic phenomena areal teleology manifests itself purposefully, displaying "Zielstrebigkeit". By communication in the widest sense — whereby land, rivers, seas and atmosphere are used purposefully by the different human groups for the exchange of material and spiritual goods of the various areas — the human geographic phenomena and areas are combined into a system, into a whole by which the areal diversity forms a unity [14].

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[14] About the theological and functional view in general, cf. H. Bavinck, *Christelijke wereldbeschouwing*, 3e druk, 1929, pp. 54, 65—67; P. v. Handel, *Kausalität, Finalität, Determination und Freiheit.* Studium Generale, Jhrg. 3, 1950, pp. 660, 661; Th. v. Uexkull, *Der Begriff der Funktion und seine Bedeutung für unsere*

In the course of centuries this areal functional teleology has in the various human geographic areas been developed in very different ways and to a greater or less degree. At first the areal relations of a definite area to other areas are limited to this area and its immediately adjoining regions. Thus smaller or larger units were formed which were apart from one another and did not know of each other's existence or hardly so. We have in mind e.g. such large wholes as the Ancient Roman Empire or the vast Chinese whole of territories in antiquity. With time this functional whole becomes larger. At the present day there are wholes that in many respects span the world. The relations of a definite area extend to so many other areas that such an area "replenishes" as it were the whole world. It shares out to other regions of its own specific assets and from other areas it receives back their rich diversity. The areal functional participation and orientation refer to all natural and cultural goods: Raw materials, auxiliary materials, capital goods, credits, consumer goods, knowledge and techniques, material, spiritual and moral goods. We need only think of the areal relations of an area producing motor cars with those areas supplying the raw materials and semi-manufactures for this area of production. According to Otremba the number of suppliers amounts to 300 or 400. And how many areas are concerned in the goods of which the average citizen of a modern area daily stands in need? [15]) The areal orientation that manifests itself in the areas mutually providing for each other, shows an extension from local and regional to national and international care.

However, the areal diversity and areal participation comprise not only the wealth and the beauty of nature and culture, but, by man's sin, they also show the poverty and the corruption of both. For every area as differentiation and reflexion of the nature and the culture of the earth as a whole possesses both the good and the evil of this whole. And by areal participation and orientation a region may share not only the beauty but also the corruption of the areal diversity of the whole earth. The geographic aspect and the norm of human geography are not entirely separate from the aspect and norm of nature and culture in general and as such.

Vorstellung von der Wirklichkeit des Lebensvorganges. Studium Generale, Jhrg. 2, 1949, pp. 13—21; I. M. Bochenski, *Die Zeitgenössischen Denkmethoden*, Bern, 1954, pp. 115, 116.

[15]) E. Otremba, *Allgemeine Agrar- und Industrie-Geographie* (Erde und Weltwirtschaft. Band 3), Stuttgart 1953, p. 220.

But, although these aspects and norms are connected, they are clearly to be distinguished. For besides the fact that areal diversity shows a reflexion of the beauty and corruption of the nature and culture of the earth, wealth and beauty on the one hand and want and corruption on the other are present in the structure and the function of areal diversity and areal participation. Besides the development of the ordinances of creation thanks to common grace the consequences of sin also make themselves felt in the areal diversity itself: In one human geographic area we notice that the area's own specific character is overstrained, whereby the value of the total diversity of earthly nature and culture and the unity of this diversity is rejected. In another area the area's own specific character has not been developed by export of its own specific natural goods to other areas and enforced taking over of cultural and spiritual goods from these foreign areas, by which the areal unity of the earth degenerates into similarity and areal diversity is superseded. Nationalist endeavours is an example of the former, some forms of colonization and the communist world domination are instances of the latter.

In other cases of a disturbance of the areal functional participation we can often hardly speak of a direct influence of sin, but certainly of an indirect influence, when the consequences of the curse resting on creation are perceptible: The wheat area of the Great Plains in North America supplied many territories of the earth with bread. From other areas it received in return other consumer goods and capital goods. After the great depression in 1929 many farmers of the Great Plains left their farms because the wheat could no longer be grown at a remunerative price. Areal relations were disturbed. The fallow soils, not protected by a layer of vegetation, were lost by the erosion of heat and wind. The fertile region disintegrated. But many of these farmers who had left the Great Plains, obtained a new living in fruit growing in California and strengthened this area, which acquired from it a function for many other areas. Common grace mitigated the consequences of the curse by a blessing in another place.

Similar phenomena can be observed in many parts of the earth's surface. To mention one more example: Various mining districts preparing dyes from coal tar, and providing other areas with these products, are at the same time disturbers of the production of madder and indigo in other areas. In the same period we observe in areal diversity and in areal participation and orientation the consequences both of the blessing and of the curse resting on the creation.

V. *The geographic and the historical aspect*

Geographic fixes areal diversity in a definite time, generally the present. Areal diversity is tied to that time. Human geography considers the integration of the areally differentiated phenomena as a field of forces showing a certain measure of equilibrium in a definite period and undergoing no essential changes in that period. The interconnected areal differentiations forming a geographic area in a definite period are designated by and expressed in certain qualitative and quantitative values which are different from those in a previous period.

What we are concerned with is the areal specific character of a human geographic area. But this area in its specific character has no isolated existence, it is areally related to the special features of other areas. This participation and orientation of one area in and towards other areas we designate by the term areal functional teleology. It is tied to a definite time and is distinguished from the teleology which Carl Ritter put forward in the first half of last century.

Ritter saw the importance of a land and an area for the development of a people through the ages. At the same time he considered the earth as an organic whole in its function for the progress of humanity as a whole. A progress which was directed to a final destination. The earth was the "Wohnhaus und Erziehungshaus" in the history of humanity. This teleological conception is very important, but essentially historical. It places the geographic phenomena in a historical frame [16]).

Ritter saw, indeed, the areal integration of the areas within larger areal wholes, as e.g. the continents. But he paid little or no attention to areal diversity as a unity and a whole of diversity in a definite period. The chorological functional finality i.e. the participation and orientation of one area in and towards many other areas and the participation and orientation of a whole of areas in and towards one area in de definite period is not central in Ritter. He concentrated on the progress and course of development of a people in connexion with its area and on the development and history of mankind as a whole in connexion with the earth's surface as a whole.

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[16]) Cf. *inter alia* C. Ritter, *Einleitung zur allgemeinen vergleichenden Geographie, und Abhandlungen zur Begründung einer mehr wissenschaftlichen Behandlung der Erdkunde*, Berlin, 1852, especially III, 3: Über das historische Element in der geographischen Wissenschaft, pp. 152—181; E. Plewe, *Untersuchung über den Begriff der vergleichenden Erdkunde*. Zeitschrift der Gesellschaft für Erdkunde zu Berlin, 1932. Ergänzungsheft IV, pp. 28—46; R. Hartshorne, *The nature of geography*, 4th printing, Lancaster (Penna.), 1951, pp. 61, 62, 65, 68, 70; A. Hettner, *Die Geographie* usw. Breslau, 1927, pp. 299—317; E. Wisotzki, *Zeitströmungen in der Geographie*, Leipzig, 1897, pp. 267—323; G. de Jong, *De Duitsche landbeschrijving in de 18e eeuw*. Diss. 1947, pp. 90—94.

All the time we emphasized the whole of areal diversity: To establish the specific nature of a human geographic area a knowledge is required of other human geographic areas. For the specific nature of an area is based on that which distinguishes it from other areas.

It is general geography which tries to survey the whole of areal diversity and to systematize it. It tries by comparison to reduce the endless areal diversity to important types of areal differentiations and to discover regularity in them. The areal types of different phenomena, such as areal types of climate, soils, natural vegetation, cultivated crops, economic and cultural life, are combined into areal type complexes. We speak of *areal* types and *areal* type complexes. For we are concerned with types of geographic phenomena and areas and not with types of the phenomena as such. The diversity of geographic areas is reduced to types of geographic areas in order to obtain an insight into the unity of areal diversity and into the order of this areal diversity 17).

The geographic areas form a unity of areal differentiations, but moreover the human geographic areas participate in each other in areal horizontal integration. The historical view of a human geographic area, which takes into account the development and the changes in time, cannot at the same time study the specific features of a human geographic area in relation to the specific characteristics of other areas, still less can it also fully examine the areal participation and orientation of one area in and towards others. Besides, the specific character of a human geographic area and its orientation towards other areas are tied to a definite time. In another period the areal specific nature and the areal participation and orientation will be different, and also, the areal extension may change. As to the latter point we think of a fen-peat district and an adjoining sea-clay area. The fen-peat is used for pastoral farming, on the clay sugar beets and wheat are grown. As there is a diversity here in the organisation of the production and of the industry there are two different economic geographic areas. Let us assume that the farmers of the sea-clay area

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17) l.c. 4a; pp. 59—81; 4b; pp. 15—17; 6; pp. 24 ff. K. Schmitthenner, *Zum Problem der Allgemeinen Geographie und der Länderkunde.* Münchener Geographische Hefte, Heft 4, 1954; R. Hartshorne, l.c. 16, pp. 311—365, 413—436; N. Krebs, *Vergleichende Länderkunde*, 2. Aufl., Stuttgart, 1952; E. Winkler, *Zur Frage der allgemeinen Geographie*, Zürich, Athenaeums-Schriften 1938, Heft 2.

in a later period from economic considerations start using the land as pasture as well, and that the draining and the soil water level are coordinated. Since there is the similarity of production and industry together with the same vegetation and in connexion with very definite corresponding properties of the soil and the water economy, one economic geographic area will result, nothwithstanding the fact that the soil in other respects is different and can be distinguished into clay and fen-peat [18].

The above will show that a historical and a geographic view of the human phenomena connected with nature cannot so easily be combined. The geographer should only concern himself with history in so far as is necessary for a better understanding of the present areal integration of the phenomena.

VI. *Essential areal diversity with reference to human geographic phenomena and areas*

In his famous work "Kosmos" [19]) Alexander von Humboldt says: "In every place of the earth nature is a reflexion of the whole", i.e. every area is a reflexion of the earth's surface as a totality. It forms an areal differentiation of earthly ground and soil, of earthly climate, of earthly vegetation and fauna, and in so far as an area has been occupied by man as place of abode there are areal differentiations of economic and cultural life.

However, not every area is an *essential* areal differentiation, no more than any period of time is a historic era. Just as history seeks for an epoch in which essential phenomena form an integrated unity, which can be designated by definite values in contradistinction to the values of the phenomena in another time, so geography tries to determine an area based on the areal extension and integration of such areally differentiated phenomena which can be designated by fundamental values to distinguish them from the fundamental values of other areas.

Let us think of tropical areas which are being brought under culture. The climate, and especially the effect of precipitation and the temperature efficiency play an important rôle. Thornthwaite distinguishes in these areas *inter alia* P-E 32—63 with T-E 128 and more, which numbers denote definite values of the precipitation effect and of the temperature efficiency. These values are essential because they possess a quantitative value going with a natural vegetation of tropical grass land. The values P-E 47—75 and T-E 56—130 are not fundamental because here no essential natural vegetation corresponds to them. This vegetation is partly prairie grass and partly wood and savannah. Essential areal differentiations are those areas in which the difference and consequently the diversity is maximal and which are characterized by values, either qualitative or quantitative, which are essential for the areal diversity. Since a geographic area is a totality of areally differentiated phenomena, the boundaries of the area are determined in such a way that they correspond to a totality of *essential* areally differentiated phenomena.

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[18]) The distinction of the soil into clay and fen-peat is not based upon a difference of all the qualities of the soil, but on a difference of certain qualities which in our example of one economic geographic area are not decisive.

[19]) A. von Humboldt, *Kosmos*. Entwurf einer physischen Weltbeschreibung, Band II, Stuttgart, 1847, p. 89.

This may be illustrated again by an example. Let us take three adjoining provinces within a state. One province consists of an area of arable land and an area of pastoral land. The second province has a pastoral area — adjoining the first-mentioned pastoral district and equal to it in essential points —, a horticultural region and an industrial area which is continued in a third province adjoining it. If now the economic geographic diversity of the state has to be determined, the provincial boundaries are not the boundaries between different economic geographic areas. The pastoral areas form one area, one essential economic geographic differentiation, and the industrial areas likewise form one economic geographic area. The agricultural area, the pastoral area the horticultural area and the industrial area are essential economic geographic areas. For the economic geographic diversity of the state the provinces are no essential areal differentiations, no essential areas.

Our economic geographic division is, indeed, founded on certain presuppositions: Its starting-point is the pre-supposition that agriculture, pastoral farming and horticulture are essential differentiations of agrarian industry and that there is a fundamental difference between agrarian and manufacturing industry. Furthermore the determination of these economic geographic areas is conditioned by the viewpoint of the vertical unity of the phenomena which determines the production, i. e. that the uniform areal extension of locally integrated differentiated phenomena is made central[20]).

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[20]) l.c. 4*a*, Chapter II.

In the second section we analysed the areal diversity of the earth's surface into distinct unities of geographic totality. The intricate areal diversity can in this way be distinguished into various areal divisions which in themselves are more homogeneous: An economic geographic, a political geographic, a social geographic and a cultural geographic division of the earth's surface, forming together the human geographic diversity in contradistinction to the physical geographic diversity of the earth's surface. Furthermore in considering the ordinances of creation in connexion with areal diversity we emphasized the unity in the areal diversity of nature and culture. This unity in human geographic diversity is characterized by areal functional teleology: The areal participation and orientation of a human geographic area in and towards other human geographic areas and conversely.

Combining these views we may state that those areal differentiations in a definite unity of human geographic totalitiy which are essential, whose qualitative and quantitative values are fundamentally and maximally different, mutually show the greatest areal participation and orientation as well. The function of the areas with respect to each other and within the whole of the areas being strongest and the most harmonious if these areas differ greatly from one another. In that case the importance of the areas for each other and for the whole is greatest. Then the human geographic areas will be able to share out to and receive from other human geographic areas in the highest degree possible. These areas can participate in the best way in the whole of the areal diversity of the earth's surface. The ordinance of creation: replenish and subdue the earth will have full scope in such areas.

If, therefore, we see the meaning and norm of human geography in the principle of areal functional teleology, we have to analyse areal diversity into *essential* areal differentiations which are sharply distinguished from each other. This means that each of these essential differentiations individually are to possess a certain measure of uniformity. Then they will be distinguished from one another most markedly. A horticultural area, a pastoral region and an industrial area are more sharply distinguished than mixed differentiations, as shown by a region consisting of a horticultural area and part of an industrial area over against an area consisting of a pastoral district and part of an industrial region. This uniformity need not be simple, it may also be of a composite character: a uniform, agricultural area may consist of small areas of a corresponding character, areal units, each one with corresponding farms, with monoculture, but also with similar farms with the same but varied crops.

The determination of the diversity of the human geagraphic areas must, therefore, be based on the following principles:

1. The integration of definite areally differentiated phenomena within a determined unity of geographic totality.
2. The areal differentiations or the areas of this human geographic totality must be distinguished from each other essentially.
3. These essential human geographic areas have to possess each of them separately a certain degree of areal uniformity and unity.

If on the basis of these three principles we determine the areal diversity of the earth's surface, human geographic areas will be formed, constituting a whole in which the areal functional teleology is most conspicuous. Then areas arise in which the ordinances of creation in connexion with areal diversity reveal themselves most strikingly.

Such areas are not ideal constructions that are not found in reality. On the contrary, they have a real existence. They are, however, not directly given as such in reality. They have to be determined on the ground of the areal extension of a totalitiy of fixed differentiated phenomena. Let us take again an instance from agrarian geography: In the territory of five adjoining municipalities there are an agricultural region producing wheat and sugar beets and an adjoining pastoral area with dairy production. The two economic geographic areas work for export and do not support each other directly. We may state that the two economic geographic areas are actually as really present as the five territories of the five civil municipalities. Seen from the viewpoint of economic geographic diversity and of participation in the areal whole the agricultural area and the pastoral region are essential areas: the territories of the five municipalities are not, at least to a far less extent.

Every essential human geographic area is a limited homogeneous unity, based on the vertical unity and on a limited local horizontal unity [21]). The vertical unity comprises the uniform areal extension of locally integrated differentiated phenomena. The horizontal unity is based on a horizontal integration of the small parts of which the area is composed. This vertical and local horizontal unity shows an internal areal participation and orientation. In former times and even at the present day in primitive regions the internal areal participation is of great importance for an area. The orientation of an area towards other areas and towards the whole of areas of the earth's surface, which we may call external areal orientation is in that case only very little developed. In many modern areas of the present time, on the contrary, the participation and orientation of a human geographic area in and towards other areas and in and towards the whole of the human geographic areas are highly developed. These human geographic areas share from their own specific assets to other human geographic areas and in return receive the specific goods of many other human geographic areas. The areal orientation that manifests itself in the areas mutually providing for one another shows an extension from local and regional to national and international care.

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[21]) l.c. 4*a*, pp. 13—35. l.c. 5, pp. 154—158.

Summing up then we can say: Human geographic phenomena are determined by the vertical and horizontal integrations of areally differentiated phenomena of culture and nature. They spring from the vertical and horizontal location. The vertical location consists in the presence of areal differentiations of various phenomena in one and the same locality. The horizontal location consists in the relative location of the areal differentiations of different localities and areas, whether they lie close to each other or are farther removed from one another.

The wealth of earthly creation manifests itself geographically by the vertical integration of various essential differentiated phenomena in one place or locality, which form an areal totality. In so far as this totality of essential differentiations uniformly extends areally, a vertical unity of geographic area arises forming an essential areally differentiated totality in contradistinction to the areal totality of other geographic areas. In its own way every geographic area reflects the rich fulness of the earth's surface.

Creation also reveals itself in the horizontal integration of the essential areally differentiated phenomena of different localities and regions. On the one hand and at first it is limited to the internal horizontal integration of the different places, localities and parts of a geographic area, forming a relative horizontal unity. On the other hand the external horizontal relations of a geographic area with other geographic areas form larger wholes, often extending over the whole of the earth's surface. It is by this external horizontal integration and location that the wealth of creation will really fully manifest itself in a geographic area. This external horizontal integration takes an area out of its isolation. By this the area shares in the diversity of other areas, in the full diversity of the whole of the earth's surface. By this external horizontal integration an area replenishes the earth. However, an area can fulfil this function only if its vertical and internal horizontal unity is fully developed.

The areal participation and orientation, which we consider to be the nature and essence of human geography, really consists, therefore, in a progression from *vertical* and *internal* horizontal to *external horizontal* areal participation and orientation. In the latter earthly creation culminates from a geographic viewpoint, but it is founded in the former.

VII. *Close*

In the foregoing pages we have tried to determine the meaning and norm of human geography by deepening our insight into the nature of geographic phenomena by a discussion of geographic phenomena in the light of the ordinances of creation. We tried to show what is essential in human geopraphic phenomena and areas and how this essential character can best be determined. This is also of importance for a geographic policy, which would have to decide how new areas are to be equipped for human occupation or how old human geographic areas which function badly can be improved. The science of physical planning (planology) studies the principles according to which the destination and use of an area is to take place. Areal planning applies this science [22]). The important point in question is to determine what the areas have in common; the emphasis lies on the destination and use of an area as such and in general. Human geography will be able to render useful assistance in considering areas in their diversity and in finding ways and means for equipping them in their specific character to function in a smaller or larger whole of areas.

G. DE JONG

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[22]) Cf. Verspreiding der bevolking in Nederland. Rijksdienst voor het Nationale Plan. 1949; P. G. Knibbe, *Planologie of bodembouwkunde en streekplannen*, 1955; E. Fels, *Der Wirtschaftende Mensch als Gestalter der Erde* (Erde und Weltwirtschaft, Band 5), Stuttgart, 1954; H. Ferro, *De indeling van Nederland in economisch-geografische gebieden*, Leiden, 1953; J. Ch. W. Verstege, *Geografie, regionaal onderzoek en geografische ordening*, Diss. Utrecht, 1942, pp. 56—87. Beredeneerde indeling van Nederland in economisch-geografische eenheden, 2e verkorte uitg. 1946, (Uitg. Centraal Bureau voor de Statistiek); H. J. Keuning, *Mozaïek der functies.* Proeve van een regionale landbeschrijving van Nederland op historisch- en economisch-geografische grondslag, Den Haag, 1955, pp. 9—16, 153—247; P. D. M. Pijnenburg, *Het streekplan.* Ruimtelijke ordening als regionaal probleem, Assen, 1956.

THE DIVINE MYSTERY IN HISTORY *)

A little more than five and a half years ago I was asked in the course of the defence of my thesis in this very same place by one of my learned opponents whether I did not entangle myself in discrepancies and inconsistencies by rejecting on the one hand every thought of a fragmentary, supernatural intervention of God in the natural course of events, but on the other hand in a "proposition" attached to the thesis dared to write that although Fruin has proved that the story of a miraculous ebb-tide in 1672 is a legend and that the abnormally long ebb-tide of 2 Augustus 1673 did not influence the plans of the English to land here this does not solve the question whether the latter did not abandon a landing in 1672 and 1673 in consequence of "supernatural events".

The defence I started in reply to this objection, I was not able to finish at the time, as the time allotted to me was ended. I have thought it advisable, however, even after a prolonged interval, to resume the hostilities about the question at issue, and would ask you to give your attention for a few moments to the problems grouping themselves round the Hand of God in history. As the hand of God is generally interpreted in too narrow a sense, however, I have given a wider formulation to my subject and entitled it: The divine mystery in history.

It may not be superfluous to observe at the very outset that the word mystery has not been taken in the meaning which is in fashion now, but in the sense it has in the New Testament and therefore charged with the ineffable that is in God.

The choice of the subject must seem to be hazardous. For who—after all that has been written in the course of so many centuries—will be able to say something interesting about this difficult matter? Should not we rather be glad that at long last, after centuries of vain

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*) Inaugural address delivered on assuming the office of Professor of Medieval History and of the Theory of History in the Free University at Amsterdam on Tuesday, 27 September 1955.

disputes about the demonstrability of God's finger, the practically universal view is taken that at least the history of science, including the philosophy of history, has to be silent here? Is this question as to the Hand of God not an edifying rather than a scientific or philosophic matter, the secret of which is best preserved just then when it is kept within the sphere of faith? Is it not better, therefore, to reserve one's thoughts on the concrete dealings of God in history for a meditation in the evening of life, after acquiring ample experience in a long life of scientific work and after having realized that man should only speak about matters divine with the utmost reserve?

But there is a compelling reason why exactly now, at the moment when I am about to render an account of the spirit in which I hope to fulfil the task entrusted to me, I should occupy myself with it: every student of history, consciously or not, is confronted with the divine mystery in history; the full depth of this mystery remains inexpressible, but it will have to descend into our knowledge and into our words.

There may be an inner necessity to turn our attention to precisely those problems which have always remained unresolved in the course of years, not in order to solve them fully or to take away from them their mystery, but to find out to what depths they reach and in what recesses they are found. Can this be perhaps one of the reasons why in every age thinking and believing man occupies himself with the problem of the Hand of God in history? It is surely remarkable that after a short period, roughly speaking bounded by the two world wars, in which after many fruitless attempts at demonstrating the finger of God in history, scholars had come to the conclusion that *this* cannot and ought not to be the task of the historian, as these things are too high and too deep, and that the historian should remain within the sphere of human relations,—it is remarkable that a period of such a sane and reasonable view should have been followed by a reaction, not only on the part of theologians,—that would have been understandable—but also from philosophers and special historians. I am thinking now—leaving foreign literature aside—of the interesting discussions in works by Berkouwer ¹) and W. den Boer ²). It took some courage, at least for a special historian to vindicate the rights of the so-called theocratic view: the sometimes fierce criticism of De Boer's views clearly proves

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¹) G. C. Berkouwer, *De Voorzienigheid Gods*, Kampen, 1950, pp. 190—228.
²) W. den Boer, *Benaderbaar verleden*, Leiden, 1952, p. 60 ff.

this. There is, therefore, no question of a collective opinion, but there are indications—and De Boer's book is one of them—that the situation is changing a little and this would become still clearer to us if we should read the foreign literature on the subject.

Still, there remains the old danger of speaking about the Hand of God in history as if it were a fragmentary action of God and not an activity dominating and shaping the whole of history. It will therefore be well first to give some attention to the questions which have arisen as to God's guidance in the history of the world.

From the beginning down to the present day Christendom has been strongly aware of the close relation between God and history. There are, however, important differences in the manner in which this relation was considered to become manifest. In the Early and High Middle Ages in the time of the Reformation, in the 17th and 18th centuries and even in the 19th century—I need only mention Groen van Prinsterer—there was an extremely lively realization of direct divine action in history. In the Middle Ages up to the hey-day of Scholasticism God was so much in the centre of history and historical study that almost every event was seen and appreciated as an immediate act of God [3]): by this history practically became a concatenation of divine acts and, correlated with it, of human deeds in direct connection with divine Providence. But these divine acts were not considered to be neutral, but as it were charged with divine justice, whether of punishment or of blessing: in prosperity God revealed His blessing and approbation and in days of adversity, illness, etc. man was immediately punished for sin. It was particularly in notable and surprising events that the judging Hand of God often became manifest. Even in later times, also to many Calvinists before and after the French Revolution, prosperity as blessing, adversity as punishment and the striking and the surprising remained the most marked elements in the views on the Hand of God.

No doubt non-Christian religions, especially in Christian Antiquity and in the Middle Ages exercised a great influence on these views: in the Germanic world, e.g. the idea of the immediate judging action of the gods in the world of man is wide-spread; thus from continuous bad harvests the conclusion was drawn that the king no longer possessed divine strength. This point also brings out an important difference from the progressing view of Christian faith: in the Germanic world the continuous divine presence was clothed in magical and mythical representations: the divine and the human world merged into the divine.

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[3]) See on this especially Heinz Müller, *Die Hand Gottes in der Geschichte.* Zum Geschichtsverständnis von Augustinus bis Otto von Freising, Hamburg, Phil. Diss. 1949 (Maschinenschrift), and Paul Rousset, *La croyance en la justice immanente à l'époque féodale,* in: *Le Moyen-Age* 54 (1948), pp. 225—248.

But it is not only the Germanic world which has determined medieval conceptions: medieval historians also drew from the Old Testament or, more accurately, from particular parts of the Old Testament. Again and again they refer to texts in the Old Testament in which human deed and divine judgement are brought into direct connexion. In later centuries too, the Old Testament remains the main source for the defence of a fragmentary and directly judging act of God in history.

Side by side, however, with the view described here in broad outline we meet with a distinct hesitation to demonstrate the Hand of God after such a simple pattern, even with those who for the rest do not shrink from interpreting the reverses of enemies as a divine chastisement. Otto von Freising and Bernard of Clairvaux—to mention a few, certainly not the least—did know on certain occasions the fear and uncertainty with respect to divine intervention.

Yet this hesitation was time after time overshadowed again: the purposefulness of divine action in history was in the light of the Old Testament for many Christian authors too clear for them to have refrained from expressing an opinion.

St. Augustine, however, was aware of the divine mystery in history. He often, indeed, spoke about it in a language differing from what we consider to be in accordance with the respect due to a mystery. His conception of history is of a decidedly theocentric character, but how profound the difference between those who preceded him and who followed him in this! St. Augustine knew of the limits of human knowledge and of the mystery in history, just because history has to do with God. With a special preference he adduces texts from the Bible which speak about God's incomprehensibility. St. Augustine has seen the divine gift of happiness at a high level: only to the good God gives happiness, but because the good man is indifferent in respect of the goods of this world, every one may or may not have this happiness and therefore this happiness is no proof of divine approval, if only for this reason that full, perfect happiness is only experienced in the other world. Heinz Müller in his fine book on *Die Hand Gottes in der Geschichte* says that with St. Augustine happiness is not deprived of its value, but on the contrary its value is enchanced („aufgewertet"); happiness comes from God and when there is the right spiritual attitude and constitution, returns to him[4]). St. Augustine's conception when compared with that of the Middle Ages and of many modern, over-simple views, not only has a richer content, but at the same time it also shows us the direction in which in our opinion the solution of the problem occupying us must be found: what strikes us in St. Augustine particularly is that he knew not only of the mystery in this world and of an indissoluble connexion between the two, i. e. that the mystery in history has its origin in the divine mystery.

But the belief in the direct demonstrability of God's Hand in history involved other, no less serious difficulties. It is an undeniable fact that in historic theology there is a sometimes hardly hidden, strained relation between the direct intervention of God in history and the mystery of the Incarnation. This looks very surprising, since God's coming in the flesh is God's intervention par eminence. But the conception of history in the Early Middle Ages shows us where the real difficulty lies: when an historical event is so charged with the divine judgement and when God Himself is the only Acting One in history, Christ may recede into the background. Müller points out that in the sources studied by him from Salvianus down to the period of the Investiture Dispute, little separate mention is made of Christ[5]). Although the Mystery of Christ did not fall out, medieval historians had barred the way to themselves for a clear insight into the relationship between this mystery and divine intervention. But it is not only those "medievalists" who could not get out of this difficulty; Bossuet and other modern authors struggled with it as well.

There is a connexion between the above-mentioned difficulty as to the hand of God, and another point; we mean the fact that in the Early Middle Ages historians were hardly able to see history as a whole. It was Otto von Freising who took a decisive step to understand the unity of history and he could do this precisely by bringing history into connexion with the Incarnation[6]). This statement is perhaps astonishing: was not the medieval conception of history permeated as it were with the idea of the one universal history from Adam via Christ down to the end of the world? This is so; but medieval world histories often were not more than a stringing together of facts and the very thing that was lacking was the insight into the interaction of the facts and inner relevancy of the historical events to Creation and Redemption. The acts of God—apart from their direct cause and operation—had mostly been narrated loosely and disconnectedly and lacked the *perspective* of the one, total history. What binds them together is the continuous presence of God in history.

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[4]) H. Müller, *op. cit.* p. 11.
[5]) H. Müller, *op. cit.* p. 133.
[6]) H. Müller, *op. cit.* p. 149.

But with this we are face to face with a stumbling-block in the idea of the direct action of God in history, an obstacle not only present in medieval conceptions. How can the idea of the unity of history be maintained, if historical happenings must wholly or partly be ascribed to immediate acts? One might say: surely this content is given with God Himself, for that there is world history, i. e. that there is an interconnexion and coherence of historical facts, is only possible because they are all connected with the One God. That ultimately the unity of history lies in God, is clear, but how are we to understand the inner connexion in concrete world happenings? The solution is mostly that the unity is approached with intra-mundane, "innerweltliche" notions and the relations between the notable and surprising divine actions remain an insolvable, often not even recognised, problem.

However interesting all these different aspects which we presented here may be, nevertheless they do not form the gist of our argument. The heart of the matter lies in the relation of divine Providence to the divine world order. Many are immediately inclined to speak of coherence and harmony here and many a one will perhaps look up in surprise on hearing that between these two notions there has been from the Early Christian era, if not a contrast, a latent or open tension. And for illustration I again fall back upon the Middle Ages. It is of course possible to identify the idea of the divine world order with that of Providence, but if by the latter we understand the action of God outside the mediate way by means of the world order—God Who in this way expresses and pursues His will in history—we see that the latter thought at first greatly predominates in the Middle Ages and that it is only in the Investiture Dispute that the ideas Providence and divine world order approach one another. The relation between the two is systematically worked out by Scholasticism in a form still predominating in present-day Roman Catholic philosophy. According to her divine Providence may assert itself in the historical process in two ways: on the one hand *indirectly* by making the forces and laws operating in the world order the expression of the divine will, and also *directly* because God by direct, supernatural intervention causes matters to take a different course than could be expected on the strength of the natural trend of things.[7])

The thought of this two-fold nature of divine action in history has deeply penetrated also into Protestant circles and here, too, historians like to employ the scheme: direct—indirect action of God in the causal relations, in so far at least as the idea of the fragmentary (knowable) action of God is accepted.

In our attempts at discovering the many perplexities in the problem of the Hand of God in history we have already indicated the direction in which our criticism will move. We will only mention two reasons why also to us the traditional view of God's Finger in history is unacceptable.

In the first place our knowledge of the action of God is charged with something that it cannot and should not have here on earth. An immanent divine justice is attributed to events—at least to some—which anticipates the divine final judgement. The advocates of the view repudiated like to refer to the Old Testament, but it is precisely the Old Testament which deprives their views of every ground; it is sufficient to refer to the book of Job and to Psalm 73. In Job—this book so important in historical-philosophic respect—God gives no explanation why so much misery was brought on a just and God-fearing man, but He shows in a long revelation Who He is; and when Job has experienced God from so near-by, he no longer needs any explanations; in the few words: "I have uttered, without knowledge, things too wonderful for me, which I understood not . . . but now mine eye hath seen Thee", Job at once shrouds and reveals the real depth in the knowledge of divine action.[8]) Likewise in Psalm 73 the solution of the riddle why the ungodly enjoy prosperity appears not to lie in the syllogism, but in the recognition that God is God and in the certainty that they will appear before God. Not only the so-called action of God, but the whole of history will not reveal the full, real meaning until God reveals Himself in His fulness: therefore all happenings, all knowledge must be dominated by an eschatological desire of beholding God as He is: and it is this fulness which remains hidden from this world, also from faith, although faith knows that it is there and is present to be revealed at the end of the world.

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[7]) Cf. F. Sawicki, *Geschichtsphilosophie,* München, Kempten, 1920, pp. 173, 174, 183—187.

[8]) Job 42 : 3 and 5.

There is, however, another no less serious objection. If once a supernatural intervention of God right through the ordinary order of things is assumed, we have also assumed a split in the world order and have, at least, placed God in a dual relationship towards His creation. This objection only partly affects the view of history held in the Early Middle Ages, as in their theo-centric world-picture, very clearly reflected even in the capitularies, the idea of independent, intramundane causal relations could hardly arise. In this respect the Middle Ages are very instructive. In an evolution of decads—in pamphlets and philosophic treatises we see the thought developing that history must be accorded a certain independence, against which God is to recede to the background, except in so far as He gives proof of His presence in the immediate, supernatural deed, in punishment and blessing. According to the definitive Scholastic view we can distinguish within the cosmic order a part so well equipped by the Creator—is man's being not a finite participation of the Divine Being?—that on its own pathways i. e. allotted, prepared and maintained by God it can move in its natural, creaturely freedom towards its destiny.

In later centuries this dual or more correctly dualistic relation of God to history in a mediate and supernatural causality manifested itself more clearly also in the Protestant line with—as we saw—a double evil as its consequences: on the one hand that of the historical process becoming independent and on the other the untenable pretension of being able to understand God's judgement in some historical events even now.

I referred already to the opposition which arose in Roman Catholic and Protestant quarters against these speculations and dualistic thoughts about the Hand of God, chiefly against the impermissible intrusion into the divine secret. The books by Van Schelven [9]) and Bellon [10]) are a milestone in the endeavour of modern Christian historians to direct the science of history away from the divine and towards things human: the science of history and also the philosophy of history should no longer pay attention to "acts, plans, and thoughts of God", but occupy themselves with the historical order or with "human considerations, human intentions and human deeds" [11]). Dualism and speculation have disappeared with it—at least seemingly.

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[9]) A. A. van Schelven, *Geschiedeniswetenschap en Voorzienigheidsgeloof.* Almanak van het Studentencorps aan de Vrije Universiteit, 1924, pp. 81—88.

[10]) K. L. Bellon, *Wijsbegeerte der geschiedenis,* Antwerpen/Amsterdam, 1953, pp. 251—360.

[11]) A. A. van Schelven, article note 9, p. 86.

For the believing historian continues to admit with all his heart that God leads and determines all history, that in Him it has its origin and telos, and has its centre in Jesus Christ, Who imparts sense and meaning to everything. But with this confession of faith the same historian cannot do very much in his investigation of the concrete historical facts and connexions; if he *does* work with them the "gulf of blasphemy is in sight", in this sense that he (the historian) fastens his fallible judgement on a higher power [12]).

But here another gulf appears, no less unbridgeable and no less frightening: the gulf in man (the fragility of the simile will I hope be excused) between man's judgement of faith and his historically scientific judgement: by reason of the former God directs all things and although transcendent He is intimately present in all things and happenings; the latter declares God to be there, to have set history going and to guide it, but to human understanding He Himself is far away. Concretely we can do nothing with God. The great danger is that eventually God hovers high over our heads and that history goes its own way according to its own laws and standards. For it should be realized well that when God in His actions is no longer considered to be concretely knowable, He recedes from our view to the periphery of our existence in spite of the *general* confession of His guidance. What is left to us is the historical order with its laws and events, with people—indeed, from them (as is proved by our historical experiences) the guidance proceeds. God, however, has become a remote figure in the background, still difficult to check up and still a mystery and on that account not even to be appreciated as a factor by science.

The past and the present, thought, knowledge and action, sociology, economics and so many other sciences all have their common meeting-point in the same problems centering round the presence of the divine mystery in reality. Important matters are at issue here: the problems we have observed in the science of history stare us in the face and alarm us to an ever increasing extent in a parallel manner in the practices of everyday life.

And yet we really ought to ask ourselves whether we do not touch problems here too high and too deep, if we should not step back and should leave alone the connexion of historical questions with the last, divine "why", only answered by God. But we saw already what this fear leads to: the world of God and of man go slowly apart! And when the relation between God and history as a reality inaccessible to human knowledge is disappearing from scientific study. I wish to make the problem, in spite of the deep gulfs yawning here, the object again of scientific discussion before the matter is decided definitely.

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[12]) J. H. Thiel in a review of W. den Boer's *Benaderbaar verleden*, in: *Tijdschrift voor Geschiedenis* 66 (1953), p. 249.

And then—is the case as hopeless as all that? Although we had to state the fact that the reply to the last "why" is only given when we shall behold God, which presupposes the end of history, this does not mean that God has been silent in the meantime about His presence. God has revealed Himself and this in a time when we only know in part; but in this time there is faith, precisely that way of knowing which is correlated to the Revelation in the interim. And this Revelation contains much about history, but what is no less important: when God speaks, this concerns the relation of God and His creature: i. e. in the Bible fundamental statements occur about what is essential in all creaturely relations; sometimes the divine norm lies in the simple story about a special case. It has been said innumerable times: the Bible is not a code of law—at least not in the modern sense—and not a handbook for any non-theological science. And rightly so. But after stating this, we can take different courses: it is possible that after this we leave the Bible closed to science; it is also possible, however, that we no longer seek a special text for a special case and that in future we try to find in a special text what is fundamental and basic.

But against this it might be urged: you force your way too rashly towards a solution. And then—another will object—in this way the object of your study is God Himself, whereas science should concern itself with the things created by Him, with structures and concrete historical events; of course you should start from the fact that God has created everything and in His providence maintains all things: in brief, you are not to study God Himself, but to examine His *world*. And then the end will be a deep, reverent and devout admiration of the glorious world of God.

But to all these views, to the tendency in the Christian science of history to leave the integral relation: God—Man outside the scope of scientific investigation and to give it up to faith, we have to make a fundamental objection: God occurs in history; the science of history may be at a loss what to do with it and relegate God to a mode of cognition outside science, to faith, but with this it is not relieved of divine reality in the historical field. Only if God had done nothing else but create the world and equipped it in such a way that it could pursue its way without Him, or if God should do nothing else but maintain and order His world externally, one could really think Him to be outside history and then it would make little difference whether one gave Him a place in one's conceptions and ideas about the world. But if God really *is* intimately present in this world, if from moment to moment He acts in it and relates everything to Himself, how then can we say a single truth about history, and leave God out of consideration and only utter a single general confession about His providential administration? Suppose some one were to write the history of the Renaissance and should systematically eliminate the aesthetic factor, because it was too full of mystery: who would attribute any value to the picture of the Renaissance resulting in that way? Of course the comparison is imperfect, but all the same it says something: every historian tries to do justice to all the factors determining an historical event, but why does he not in the same way take into account and pay attention to the Divine, which is more than a mere factor?

There are scholars who have come to a compromise: in the science of history they speak of God, but then he is a God Who is accessible to human reason. In the scientific field such a God, the God of philosophers, may indeed, be useful, because He does not radically differ from what in the domain of history is supposed to be met with. Proceeding in this line we could also be content with a "part" of truth in respect of other conceptions: religious phenomena, e.g. the Church, do not occur then in science in their religious depth, but in their intramundane aspect, their full reality being only open to faith [13]).

But the God, Who acts in history is not the God of philosophers, is not an abstraction, but the living God. And correlated with it the things that are connected with Him only occur in their full religious dependence.

If in the knowledge about history divine action and the creaturely answer to it is abstracted and left out of consideration, this will greatly affect (as has become sufficiently clear to us by now) our historical experience. To abandon the traditional Christian thought of the perspicuity of God's ways in history means more than no longer show God's hand in any historical event. The development of no less a person than the historian Ranke is most illuminating: it is well-known that in his early days he cherished the wish to show God's providential action concretely in history, to contribute his share "diese heilige Hieroglyphe (zu) enthüllen![14] — the simile will have appealed even more in 1820 than now—. But afterwards Ranke shrinks back from such statements and although he remains highly conscious still of divine world government, he restricts himself in historical narrative almost entirely to "die natürliche Lauf der Dinge" and their mutual relations. Then it is the ideas and the principles, the spiritual-worldly elements and the spirit on which they are based, the mysterious inner forces, the inevitable course and the nature of things, the natural trend of politics, etc. that determine the trend of word-history [15]). The change which has taken place is very thorough indeed: God remains background, and Ranke is keenly aware of God being the really Acting One, but now that the dynamics of history cannot in the concrete be attributed to God, it is necessary to look out for somebody or something else: the intramundane phenomena are now charged with forces that properly speaking only belong to God or only function in the direct relation between God and the world; having once been "drawn down" into "mundane" characters, they are bound to lose their divine character and thought into mundane realities which, however, still clearly betray their pristine strength originating from the divine sphere. For the historian cannot stand still; he has to go on; when in the concrete God falls out, much will fall out with Him, and in order not to have the historical process split up into a multiplicity of elements the idea of a natural process operating according to immanent laws will function as "Lückenbüsser".

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[13]) See H. F. Kearney, *Christianity and the study of history.* The Downside Rev. 67 (1949), pp. 62—73.

There must, therefore, really be a close connexion between divine and mundane affairs: for when things divine drop out, at least for our human understanding, substitution at once turns out to be necessary in the human sphere.

Is it not possible that the problem—which in the meantime may have become clearer but also more complicated at the same time—would come nearer solution, if we interpreted God's action somewhat more accurately, no longer as a fragmentary intervention in the surprising and extraordinary event, but as God's action in the history of salvation: then, indeed, we can speak more clearly, viz. about God coming in the flesh, about the guidance of the Holy Ghost, about the public

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14) Letter from Ranke to his brother Heinrich, end of March, 1920 (*Briefwerk*, 18).

15) Cf. F. Baethgen, *Zur geistigen Entwicklungsgeschichte Rankes in seiner Frühzeit*. In: *Deutschland und Europa*, Düsseldorf, 1951, pp. 337—353.

life of God's Church on earth; and then: did not Christendom in early and later centuries always see Christ's coming as the centre of the world's history? Do we not move here on the firm ground of, it is true, religious but all the same concrete facts and interconnexions? We shall leave aside now the in our opinion impermissible contrast which is thus made between the Providence of God and the work of Christ, but this "illustration" does not work, if only for the reason that with regard to the central position of the Incarnation—without which no history of salvation can exist and be known—we have to face the same difficulties as we are confronted with in indicating the Finger of God. In both the divine mystery is involved and in both *this* imposes the same limits on our knowledge.

From whichever side we approach God, we are always face to face with the mystery. But also: from whichever side we approach historical reality, we always meet with the mystery there, for God stands in such close relationship to His world that as long as the mystery in God remains, the mystery in earthly existence will continue to exist as well. If we should think away this divine mystery, the earthly mystery would turn into mysteriousness. We should leave the mystery what it is: mystery.

Is then the result after all an admission of the impotence of our knowledge, at least scientific knowledge? But the mystery has come down into earthly relationships and it has also entered into human knowledge. This brings us to a profound, searching question—asked in humility—has not science gradually become so much estranged from divine reality that it no longer possesses the organ to include in its problems the relationship between God and His world? Are we not to find in this estrangement the deepest ground of the alienation of science from the mystery in intramundane relationships? Again and again the knowledge about God's guidance in history is assigned to faith—this guidance, therefore, is knowable, it appears—but then the historical-causal connexions are considered to be a matter of science. If God's guidance were only a loose, seperate action of history, faith and science could make history in its entirety known to us. But God is by no means something incidental, for He stands in relation to the whole of history. If God then is so intimately present in things, they are only fully known when the knowledge about the divine mystery is contained in earthly knowledge. Is this mystery a prejudice? By no means; the concept prejudice arose to designate that which lies before rational thinking. But what faith tells us is woven into, bound up in scientific knowledge and scientific judgement is only correct and true in so far as it also contains what is known by another way, i. e. by way of faith. Or more accurately—for this might again give the impression that it is a question of two seperate modes of cognition—faith is not an ornament of knowledge acquired in another way, nor is it a subjective prejudice that the scientific investigator can never completely break away from, but it is a content—consciously bearing on God and divine Revelation—of the scientific method with which the investigator opens up his "field".

In Christian thought the mistake has often been made that the scientifically inexplicable part of the world was declared to be the domain of faith. The fatal consequence was not only that in the triumphant advance of science the domain of faith dwindled down and shrank, or at least became dependendent upon the ambit of science, but also that an entirely erroneous view was formed of the object of faith of the divine and intra-mundane mystery: fundamentally the mystery of faith overagainst science was identified with that which had *not yet* been explained by science. This has done incalculable damage to both faith and science!

But why should faith be excluded from the scientific attitude, if intra-mundane relations are qualified by religion? In order to be opened up fully, reality itself asks for a method of approach suited to it. The concrete historical event is generally approached by different ways, from the science of history, and from the philosophy of history, and sometimes also from faith or from theology. In this way certain aspects of historical events may, indeed, become more clearly visible, but it is a problem in itself how these results, obtained in a fragmentary manner, can even reflect the full reality of the event.

To save time much was stated in the foregoing without there being an opportunity for a more thorough exposition of the fundamentals. Nevertheless I think that from the "re-statement of the theory of cognition" [16]) which takes its starting-point in the recognition of the fundamental unity of special science, philosophy and faith, a good starting-point has been found to know the divine mystery in history better.

It is remarkable that in nearly all great systems of the philosophy of history much attention has been given to the problem of suffering.

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[16]) Cf. J. Münzhuber, *Erkenntnis und Glaube.* In: *Zeitschr. f. Philos. Forschung* 3 (1948), p. 73.

Suffering is conspicuous in history: the fall of nations, massacres, wars etc. have such a far-reaching influence in the lives of nations that they must be accorded a place in every conception of history. But with beilderment we read how this suffering is taken for granted, as a matter of course; now it is the trend of circumstances, the inevitable, in the convergence of historical factors leading to the tragic situation; now again—and in that form suffering especially occurs in the philosophy of history—it is a necessary phase of transition to a new era, to the happiness of future generations that suffering has to find its justification in the perspective of history. Suffering has got its place and its meaning in the totality and has got wedged in between the phenomena and events. As soon as the science of history began to secularize it also became necessary to find for history an intramundane conditionedness or meaningfulness. In his book *Le mythe de l'éternel retour,* in which excellent pages are devoted to the meaning of suffering in history, Mircea Eliade says: If not any trans-historic sense rises above and beyond the mass-deportations and massacres of the present time, suffering is only the resultant of the blind play of economic, social and political forces [17]). We would specify and accentuate this statement: how can the *individual* bear the suffering resulting from the action of historical forces when he has lost the prospect of a trans-historic world? But does not the problem raised here apply to *all* that is history, to the world's history as a whole, even apart from the suffering that is inherent to it? In the great historical-philosophical conceptions suffering has again and again been justified from an immanent historical purpose: and in these conceptions the previous periods have likewise been judged from a subsequent era, or one period derived its significance from another, the following or preceding epoch. Generally the previous periods were transitional phases or introductory stages to the following and eventually to the ideal time towards which history was moving or which was about to "break through". The achievements of former times were then either (negatively) rejected as darkness before the break of dawn or (positively) appreciated as a prelude, but in each case measured after the standard, not of the writer's own nation, culture or period, but after the significance they had for other times and cultures which were to play a leading part in history, now or later.

It has especially been the cycle-theory that opposed this view:

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[17]) M. Eliade, *Le mythe de l'éternel retour*, Paris, 1949, p. 222.

every culture develops according to its own law, finds its standard and meaning not in the value of other cultures, but absolutely in itself. The result has been that the cyclical and historical views of the world's history, in order to save the value of the individual cultures have broken up the history of the world and only in an intrinsically conflicting manner can they know the content of other cultures than their own.

This opposition against imparting sense to a portion of history or to an historical event in the light of the final meaning of history has also led to a denial of the idea of world history or at least to denying a transhistoric sense unifying many events and phenomena into an intrinsic unity. Every thought of a world history deriving its connectedness and meaning from meta-history is fiercely attacked nowadays from many quarters; the attention is now focused on the idea of the historical event or connexion exclusively determined by intramundane forces. The concept world history can be accepted still, however, no longer as a supra-historical unity but as a multiplicity of "culture meetings", as a space for "activity complexes" [18]) which can be empirically ascertained without theological and speculative-philosophical prejudices and presenting themselves to specialists as world historical situations. Or the starting-point is the historical event which has its meaning imparted to it from outside, from reason, but which possesses it in itself and radiates it in its irruptive power: history itself creates unity then from the intra-mundane events and forms the space for the 'sens entrecroisés" [19]).

We are fully aware that we are confronted with a perplexing dilemma. Thévenaz even speaks of a Copernican turn things are taking in the philosophy of history. The irreconcilable contrast seems to be this: history receives its meaning and significance from a transhistoric world or from an ideal period in which the transhistorical meaning has settled or to which it impels its richness to a full development. Unity and integration of world history are not warranted in that case by external factors and consequently not menaced from moment to moment—they even endure ruptures and revolutions—but the elements of history have to make the sacrifice of their own value because they must suffer themselves to be measured by transhistorical standards or to immanent historical values, nevertheless made absolute. In the rejection of the Christian or secularized conception of world history, however, the individual value of the historical event, culture or period is safe-guarded, but the real, the essential question how the integration of events is effectuated, how it really is possible for facts to join hands, how historical complexes unite, is ignored [20]).

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[18]) Inter alia H. Freyer, *Das Problem der Einheit der Weltgeschichte.* In: Philosophische Vorträge und Diskussionen. Bericht über den Mainzer Philosophen-Kongress, 1948. Wurzach, n. d. pp. 180—184.

[19]) P. Thévenaz, *Evénement et historicité.* In: L'homme et l'histoire, Paris, 1952, 217—225.

And then: if a transhistoric unity in world history is denied, is the independent value of periods and cultures saved by it? And once this independent value, this immanent historical meaning in complexes and events has been safeguarded, will history be knowable and livable then?

Our expositions about suffering and world history have made it clear how deeply the recognition of a trans-mundane, divine world influences our views of history. Present-day philosophy of history in one of its main trends sets out to re-think the historical problems from absolutely intra-mundane elements. This Copernican turn first of all affects, indeed, the rationalistic historical conceptions, but is most-certainly also aimed at the Christian faith in a transhistoric sense in history.

But it may be objected that all this only concerns the philosophy of history, but what does it concern the science of history as specialist science?; it is obvious that at one time or another the philosophy of history will have to concern itself with things divine, but special history is only concerned with suffering and world historical connections in so far as it can ascertain and explain them empirically. The specialist will be surprised and highly gratified to find that some currents in the philosophy of history arrive at the very result attained by the special science already more than a century ago: that is: at the empirically ascertainable connexion and the concrete event which has its meaning absolutely in itself, independent of the influence, the action exercised on it by something absolute. No doubt there remains an important difference between the special science and the philosophy of history as regards the denial of a transmundane meaning in history: the latter does so first of all from basic conviction, the former, however, above all from methodical considerations. But we had better see what the denial of transmundane meaning in the historical fact—whether this is done from philosophy or from the special science—means for this concrete, historical fact and for the empiric whole.

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[20]) It is not surprising, therefore, that Nicolai Hartmann at the congress of German philosophers at which H. Freyer stated his ideas declared that he could not share the latter's optimism.

Mircea Eliade in his above-mentioned book speaks of the *terror* of history. Does he perhaps mean by it death and the transitoriness, the being forsaken of what was at one time, and the being chased away from the familiar, historical environment? Or does he mean by it the misery and suffering of the peoples? No doubt he does, but in the terror of history he is really concerned with history as such, apart from the misery and doom it brings with it. Can history be endured by man if it is nothing more than an immanent historical process? This question of Eliade's is an all-important and decisive one. It might also have been asked in the nineteenth century and it *was* asked then, but in those days people were too intent on a happy future and were looking forward too eagerly to what history would reveal for them to give such difficulties much thought. Even when the philosophy of life engrossed the minds of many and an unrestrained historicism began to pave the way towards relativism, the belief remained in a "creative formation" in which one generation passes on to the next what is handed down, augmented and deepened. When, however, from whatever cause, the idea of progress was losing its charm, nothing remained but the complex, though naked, fact and the mere integration, whether of a world-historic nature or not. The sense of life of modern man met that which special science had yielded by way of experience, in so far at least as the latter had remained within the domain it had claimed as its own. The situation thus created has been reflected in existential philosophy, which in these things speaks a language in which modern man in more than one respect recognizes his own attitude towards history. In the presence of history he has the ever growing feeling of facing a strange power threatening him even when it is full of promising possibilities and progress. History no longer appeals to him and man does not recognize himself in it any more. From this current of history intrinsically alien to him he cannot detach himself, because he is essentially history himself. The only thing he can do is *to try* to detach himself at the existential moment from historical relativity to obtain an absolute value. The stream of history remains, but only as a secondary reality and man continues to be surrounded by it as if by a prison.

This has created a very complicated situation: in a process of decads of years man has tried to free himself from the transhistoric integrations determining his destiny from the outside, and now that he has obtained the desired freedom mundane reality, robbed of transhistoric meaning, frightens him. No doubt this consciousness of a menace proceeding from freedom is not general. But the characterization given just now should not be met by the observation that there is still much love of history: what frightens man is the fact that he himself essentially belongs to history and that it is no longer possible for him to rise above it.

Those who have closely followed our expositions about the estrangement of man from history, which is rooted in the need for a transhistoric meaning, might come to the conclusion that the embarrassments and terrors of history can only be the business of the philosophy of history and not of the study of history. Such a conclusion suggests itself the more easily as according to special historians the philosophers of history by their pre-conceived systems stretch history on a Procrustean bed, and place man in a tight corner. But such a conclusion is decidedly wrong. The difficulties and terrors of history affect special science: it is not even excluded that the origin of the error of history is also partly to be found there. For is it not remarkable that the immanent-historical event, which is increasingly the starting-point of the philosophy of history of to-day bears a close resemblance to the empiric datum with which special science always worked? It is just the concrete, historical fact, ascertained by way of an historical method which is constantly being refined and perfected, from which the menace proceeds which looms up from history. The menace we are speaking about could only arise when the transcendent background of history, which was also present still in the secularisation of the Christian values, receded. As long as man still knew himself to be one with the primitive soil of the world he felt safe and secure in history and he could confidently entrust himself to its course, even then when the familiar routine of things was broken through.

The menace of history threatening man has its origin in his having fallen away from historicity and in man's being estranged from history, which was the consequence. But how can the science of history also be guilty of it?

It is often said that the science of history is concerned with establishing facts; not of isolated facts, since they are so closely interwoven that in the empiric knowledge about the historical facts the connections are also given. If, therefore, an historian wishes to know a fact, he turns not to an isolated atom in historical reality, but to a datum which with innumerable connexions has been received within a larger whole. He endeavours to trace the causal relations in history, or, in a wider formulation, he attempts to account for the conditionedness of the historical phenomena. For according to the current scientific view these are determined by a great number of factors and circumstances which do not make their influence felt arbitrarily and in confusion, but have themselves been received within well-ordered wholes, or—according to more recent views—in basic structures. Man is not only conditioned from the outside in a delicate system of economic, political, social, physical and other causes, inducements and influences, but his thought and action is also determined from the inside, among other factors by his psychic nature. From a thus conditioned historical event with man as agent, activities proceed again to other circumstances and historical units. The result at which the history of science, in collaboration with other sciences has arrived, is, therefore, that things, events and men are not only determining factors themselves, but have been enclosed, received and directed by and within a powerful whole of forces and powers, of structures and systems. In an extremely varied manner the historian is able to express the conditionedness of the historic event: "on acount of", "because", "the result was", "was bound to" and so on and so forth are only a few of the terms employed.

The historical world is not yet closed; for in the twentieth century it is more keenly realized than in the nineteenth that a full understanding of the extremely complicated character surpasses human knowledge. It has often been optimistically expected that for unsolved historical problems, amongst others the origin of medieval cities, or of the Eighty Years' War, time would come to the rescue, i.e. that as the material increased the connexions and relations would become clearer to us: the result was often the reverse; the more comprehensive our knowledge of an historical phenomenon the more complicated it presented itself to us and in the same measure the problems increased as a rule.

But not only did scholars continue to be keenly alive to the limitations of human insight into the conditionedness of historical phenomena, but at the same time did they hasten to assure again and again that the historical causal connexions have not the character of laws of nature and that human freedom should remain untouched, nay, that it is even on the way towards a richer and fuller development, especially owing to more favourable social conditions.

However sincerely these words may have been meant, the seriousness both of the scientific and of the human situation has not diminished with it: by means of purely scientific methods the result has been arrived at that man is as it were wedged in between factors, influences and systems, partly knowable, partly unknowable, partly rational; partly irrational.

Now this is the menace proceeding from the trend of history of which Eliade spoke: in the religious view of history there are also these historical facts, their connections, their apparent inevitability, but in it there is, often hardly consciously, the knowledge: not the historical facts themselves have power, but they are determined by God; they have been included in a purposeful, divine plan. But in secularized thought the facts have a meaning and power simply in the circumstance that they exist; having their own meaningfulness they make their influence felt with regard to other facts, and also in respect of man; they are autonomous power-stations equipped with apparatus which really—it is said with reverence—only belongs to God; they are powers moving towards men and things along roads of causality and influence and overwhelm them in their mysterious anonymity and make them subservient to them. We do not mean here calamities and disasters nor excesses like despotism, tyranny, revolution, deportation, but an ordinary, inconspicuous, morally, legally, socially, or economically justifiable fact; it is even possible that it brings prosperity and happiness along with it. The fear of history is not caused by evil in the current sense, but by the fact that man is subject to the historical course of events.

Does this not mean a disqualification of the world order? Do we not deny here that God created things "in right order"? If, however, the elements of the world order are taken away from the relation to God, things remain which have their own value and self-conditionedness, and have their meaning and purpose in themselves. A history equipped in this way is to an increasing extent experienced by man as an alien and hostile world.

The peculiar thing is that when the conviction of the intra-mundane conditionedness of the historic fact penetrated further and further into science—a conviction which was often attended with the thought that God is not concretely knowable in history—many did not clearly realize that the circle of influences and connexions cannot be completely closed, that there are breaks in the continuity of historical reality. A few examples may make my meaning clear. Few historians will deny a causal relation between the murder of the Archduke of Austria and the outbreak of World War I; here, too, there is a difference of opinion, but this concerns the relation of this factor to other factors leading to this war. And yet: neither the murder of the Archduke, nor any other factor, nor all factors together brought about World War I with cogent necessity. The very thing that remains inexplicable is precisely *that* that murder had that consequence.

The empirically established connexion between cause and effect, between the elements of a connexion could have been broken. The question is now: in what ground is the possibility rooted both of the establishment of the connexion and of the breach? It is becoming likely that the connexion between cause and effect, that the conditionedness in the widest sense is wrapped in a mystery, although it is felt by many that just here there is no mystery, but at most an incompleteness in our knowledge. In our opinion the divergence in the explanations of a phenomenon may originate in the breach between cause and effect: the multiplicity of opinions is not only possible on account of the complicated character of a phenomenon, but particularly because the lines connecting the factors with the result, run through an area where the cause is transformed into the action.

I may adduce another example. In studying the Carolingian Renaissance we may attribute its origin to many influences, but ultimately we shall have to ask ourselves in surprise how it *has* been possible that such a thing as the Carolingian Renaissance came into being; for here, too, the great problem is just how all these influences could bring about such a phenomenon [21]).

Summarizing we may conclude: in the transformation of causes into consequence, in the transition from influence to result, lies for the consequence and for the result—I speak as I did before, "after the manner of men"—the possibility of deliverance from the cogency of circumstances.

Is it possible that the continuous breaking of the historical connexions and the deliverance from the terror of history have something to do with each other? With regard to man two things may be affirmed at the same time: On the one hand he is surrounded by and incorporated in most powerful connexions of organizations, structures, influences, etc.; on the other he is lifted beyond intramundane relations: by a transcendent power, the Transcendent One, God, he is lifted beyond worldly interplay, and is directed towards the Transcendental One. In religion—understood as the relation between the living God and the creature—man is unassailable to intramundane relations: there is something in man that is beyond it. However much according to our human ideas the facts may be charged with divine forces or transcendent forces transformed into the mundane, and on account of the meaning they have in themselves, have power over worldly relationships, in reality man, in a way at least, is beyond their reach. In this region, of security and protectedness in the relation with the Transcendent One, where man rises beyond the mundane, lives human freedom and responsibility. Both those who devoutly believe in the Transcendent One and those who do not esteem Him or carelessly pass Him by, are lifted above intramundane relations: even *in his state of rebelliousness man is kept by Him in the transmundane relationship,* and he may be called to account in it.

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[21]) Cf. Butterfield, *Christianity and history*, London, 1949, p. 93 ff.

Our formulations might give the impression that only a definite section is beyond the reach of the mundane. But the position is rather this that total man and in him history as a whole is included in the transcendental relation of deliverance.

But is the freedom enjoyed in the transcendental relation, the rising above the intra-mundane conditionedness not contradicted by the daily and scientific experience that intramundane relations nevertheless retain a firm hold on man and that he remains subject to the power of historical facts and that the organization, institutions and powers in growing measure extend their rule over life? It is, therefore, not sufficient to recognize that man surpasses historical relations, but in order to escape from the grip of the intramundane, to escape from the full conditionedness, it is necessary that this mundane is deprived of what makes it possible for him to secure power over what is in this world: the mundane and with it the historical fact must be deprived of what constitutes it the mundane and the factual, i. e. their autonomy, their condition of being powerful and meaningful in themselves.

Just as nobody else but God can cause the intramundane relations to transcend into the transcendental relationship, so nobody but Christ can deprive the things by which they assert themselves of the absolute. In a radical manner Christ speaks in the Revelation about the breaking of the continuous, horizontal trend of things and of the historical connexions and of the end of the inherent powerfulness of the facts: in the Sermon on the Mount, when He condemns the very human attitude of being solicitous, of thinking about those things that are so important for earthly relations, replacing it the concern about the Kingdom; Christ also speaks about it when He makes the cutting of family ties and the turning away from the most intimate relationships a condition for entering the Kingdom [22]). The incisiveness of Jesus' words has often been weakened by making them apply to only a special category of persons or exclusively to the private sphere: but Christ demands us, on the contrary, to leave and hate that which plays an elementary part also in historical relationships. It has also been tried to take away the radical character of Jesus' words by accommodating them to other words of Scripture that speak of the demand of love and of the care to be bestowed on the things of life. But also in this interpretation remains hidden what has clearly come to light with the Incarnation. The normal idea among men is that without God things may still have some value, minister to human wants and give gratification; but it is just this that Christ came to stop; the condition for coming to God is to give up natural relationships, maintaining their *inherent* powerfulness and meaningfulness, leaving out God.

Some one may object: But God surely created a good world and the ordinances—amongst others marriage, which He seems to pull down to the ground in His demand of hating father and mother, He maintained also after the Fall. But the ordinances have availed themselves of this very fact to constitute themselves without God and against Him, to gratify the people and to meet the needs of their lives. Christ does not turn here against the excesses in marriage or in the other relationships of life, neither against their overstepping the limits, but against the intramundane relations conforming to the standard of a well-ordered community. Christ attacks their autonomy and self-sufficiency.

Things, historical relationships continually need this that they constitute themselves afresh, that—deprived of what was hitherto essential in them—they should again come into being. And thus historical facts and connexions return again, but deprived of their inherent meaningfulness and with it of their menace and superior power. In the transition from *inherent* "powerfulness" to divine mercy the nature of facts has changed; they have received a new bias and a new focus: they are directed to God, Who according to St. Augustine determines the nature of man and also controls the course of history: fecisti nos ad Te [23]). We may conclude from Christ's words that this inclination towards God does not leave the ordinances and facts untouched, but affects them. Therefore it was possible to speak about historical things anthropomorphically: from their relation to man springs their autonomy and self-constitution; but in that same relation they are an object of divine renewal. If then the relation to the Transcendent One first constitutes the fact, it is not possible any longer to understand intramundane relations without taking this relation into account.

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[22]) St. Matthew 6 : 25—34; St. Mark 10 : 29 and 30; St. Luke 14 : 26.
[23]) St. Augustine, *Confessiones* L. I, c. 1.

We have travelled a long way—in the opinion of some perhaps a thorny roundabout way—to arrive at the following result, which can be formulated in a few words: history contains more then only intramundane conditionedness, it also contains the relation to God. But this is a too quantitative and too spatial statement. The question is, however, if human words even *can* express how deep the transcendental relation reaches in historical relations. The constitution of the fact seen from this relation implies at least that in their intramundane conditionedness they are from the outside and from the inside at the same time determined and directed from the transmundane, divine world.

Passing along a double negation, on the one hand that of a fragmentary, supernatural action of God, on the other of a limitation of the science of history mainly to intramundane relationships, we arrived at historical facts and relationships which only constitute themselves in their relation to God, either negatively because they assert themselves in an absolute sense [24]), or positively because in the divine-human meta-noia they affirm the transcendental relation.

The historian is concerned with such facts and relations, not only the student of the philosophy of history, but also the special historian. It will be his task to re-think the historical-philosophical problems from the angle of the interaction of ultra-mundane and transhistorical reality-problems like the unity of world history, historical causality, the division into historical periods, the part played in history by great men, a problem that has reached a new stage since Huizinga measured their activity via the holy by unearthly standards. Nor should we omit mentioning the fact that also Roman Catholic thinkers have begun to reconsider these phenomena from the angle of the relation to God and in their being transcendentally directed towards the absolute: in this connexion the studies by Bellon[26]) and Kwant[27]) may be named. What their and our own standpoints have in common is the denial of an exclusively intramundane transcendence, but the roads part when as a background they choose a natural theology and as a starting-point the doctrine of participation i.e. the idea of the finite as participation of the divine Being. With them, too, the transcendental relation has been too exclusively utilized for the philosophy of history and it is questionable whether in their conception the special sciences, which examine the factual growth of things can do justice to the presence of a religious relation in things created.

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[24]) To avoid misunderstanding it must emphatically be pointed out that in the view defended here it is not only the Christian world that is of importance: all peoples, cultures and all historical phenomena concern the Christian historian, as they are all lifted beyond historical causality and are kept in the transcendental movement, in spite of the nations (cf. St. Matth. 6 : 32).

[25]) J. Huizinga, *Historische grootheid* (1940), In: *Verzamelde Werken*, VII, Haarlem, 1950, p. 217.

Thus it will not be enough for the special historian to heed the signs of the times and to shift the accent now from national history to the supra-national and world-historical aspects or to direct the attention from political to cultural and economic factors or to the structures in history. Of however radical significance these shifts may be and however much they will modify the historical picture in the long run, nevertheless they will always be intramundane relativations of the kind we have known already so frequently and which generally result in making the recently discovered or only now appreciated factor absolute. What we mean, however, is: what does it mean that e.g. economic life is not only determined from intermundane, but also from transmundane reality, and that, to mention another problem, the national element—I do not say excessive nationalism—no longer makes itself felt autonomously?

Problems are disclosed here to which I wish to devote myself from now on. This will not be possible without a firm conviction and the glow of enthusiasm. But above all it is necessary that God disturbs in me wordly-mindedness, fears of difficulties and over-hasty satisfaction at results obtained.

I know that when one wishes to practise science in such a close relation to God the danger exists of losing sight of the truly divine. None the less I adhere to Blondel's words: God must not remain outside our affirmations of the concrete.

M. C. SMIT

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[26]) K. L. Bellon, *Wijsbegeerte der geschiedenis*, Antwerpen/Amsterdam, 1953; Onder welke voorwaarden is de wetenschap der geschiedenis mogelijk? Tijdschr. v. Philos. 15 (1953); pp. 163—178.

[27]) R. C. Kwant, *De historie en het absolute*, Ibidem 17 (1955), pp. 255—305.

NEWS ABOUT THE UNIVERSITY

DISSERTATIONS

In the course of the Academic year 1956/1957 the following dissertations were defended.

In the Faculty of Theology:

M. J. ARNTZEN, *Mystieke rechtvaardigingsleer* (een bijdrage ter beoordeling van de theologie van Andreas Osiander). Kampen, J. H. Kok N.V., 1956 (181 p.).
(*Mystic doctrine of justification.* A contribution to the assessement of the theology of Andreas Osiander).

In spite of the opposition of E. Hirsch, R. Seeberg and others we maintain that Osiander's thought shows a highly mystic tendency. The Word or the Son of God, i. e. God Himself, according to Osiander has to unite with man, and in this manner man is just before God. This brings us very close to Eckhart's doctrine of justification. We have examined Osiander's theology in four chapters.

I. *Osiander's views on the Word of God.*

Osiander makes a sharp distinction between the outward and the inner word. He polemizes, indeed, fiercely against the spiritualists, who deny all connexion between outward and inner word. In Osiander's opinion he who accepts the outwardly audible word in faith, receives with it at the same time the inner word, i. e. not only a renewal of the heart, but he is united with God Himself.

II. *Osiander's views on the image of God and incarnation.*

According to Osiander man has been created after the image of God, i. e. *after Christ incarnandus*. This creation took place before the Fall so that the Son of God would also have become man, if the Fall had not occurred. If God had not sent His Son in the flesh, He would not have thought of creating the world. In Osiander's theology the thought that Christ came upon the earth as a propitiation of our sins and in order to break the works of the Devil entirely drops into the background. Besides, Osiander reverses the matter. It is Christ who assumes our nature; we do not assume His.

III. *Osiander on justification.*

Here Osiander's dogmatic exegesis stands out very clearly. Wrongly adducing Jer. 23 : 6, Osiander everywhere understands by righteousness the divine nature of God Himself. Against the teaching of Scripture the forgiveness of sins is excluded from justification. Osiander does not know what to do with the merciful imputation of the righteousness earned by Christ, no more than Rome does.

Justification, sanctification, glorification amount to the same thing in Osiander viz. to receiving God's nature, His essential righteousness, sanctity and glory.

IV. *Osiander, the spiritualists and Rome.*

Osiander is in agreement with the spiritualists in this that also the latter thought the righteousness received is divine nature itself. Only the ideas of many spiritualists were even more radical.

Osiander rejects the Roman Catholic doctrine of justification because the "monks" understand by righteousness what is a "purlautere Kreatur", viz. the virtues of faith, hope and charity. Osiander takes exception to the fact that Rome will not admit that righteousness is God Himself. Nevertheless there are in Osiander points of great resemblance to Rome. Both reject the so-called forensic justification. Meanwhile there are also in the church of Rome strong mystic currents, and many openly speak of a deification of man. But we may quite agree with Dr. A. Kuyper that Osiander has left us a doctrine of justification "worse than that of the Church of Rome".

J. M. VLIJM, *Het religiebegrip van Karl Barth.* Een onderzoek naar de betekenis van Barth's religiebegrip voor de discussie over de niet-christelijke godsdiensten in de protestantse zending, 1956 (187 p.).
(*Karl Barth's concept of religion.* An inquiry into the significance of Karl Barth's concept of religion for the discussion of the non-Christian religions in Protestant Mission).

J. D. W. KRITZINGER, *Q^eHal Jahwe. Wat dit is en wat daaraan mag behoort.* Kampen, J. H. Kok N.V., 1957 (VIII, 166 p.).
(Qe Hal Jahwe. What it is and what belongs to it).

J. C. SCHREUDER, *De overwinningsgedachte bij Johann Christoph Blumhardt.* Kampen, J. H. Kok N.V., 1957 (160 p.).
(Johann Christoph Blumhardt and the idea of Christ Victor).

After a short biography of Johann Christoph Blumhardt (1805—1880), in which we also discussed the history of the well-known illness of Gottliebin Dittus, we gave a dogmatic analysis of Blumhardt's writings in the second chapter. Not unjustly Karl Barth calls him the "Theologe der Hoffnung". The dominating viewpoint of Blumhardt's work is the idea of the eventual redemption of the whole of groaning creation. Blumhardt has come to the conclusion that the Holy Spirit no longer lives among us as in the time of the apostles. Thus he conceives the idea that the eventual redemption at the parousia will be preceded by another time of salvation. He says of it that this time of salvation will be characterised by a renewed descent of the Holy Ghost. This period, however, functions in Blumhardt's thought only as a preparation to this parousia. By this renewed descent of the Holy Ghost the work of Christ is to be made real again so that there may be a praying church. This idea gives the clue to his thoughts on the miracle, on faith and prayer. Properly speaking Blumhardt only expects a time of miracles in the period of salvation before Christ's second coming. Faith and prayer are the roads along which the King will come. Blumhardt never wearies of again and again summoning the believer to faithful prayers for the coming of the Kingdom. In all this the word about the redemption of the whole of groaning creation (Romans 8 : 21, 22) is his real "Stichwort".

In the third chapter on the resurrection of Christ we arrived at the conclusion that the Leitmotif: "Jesus ist Sieger" does not refer first of all to the resurrection of Christ, but rather to His eventual victory at His second coming. This led to the view that Christ's accession to the throne at His ascension and His sessio ad dexteram Dei are to Blumhardt really more important for man's salvation than the resurrection of Christ. This can in our opinion also be concluded from the reserve with which he speaks about this resurrection.

In the fourth chapter we gave an exegetic foundation of the critical examination and consideration of Blumhardt's thoughts dealt with in chapter II, which we take up again in chapter V. To this end we gave a detailed exegesis of Romans 8 : 18—30 and St. Luke 18 : 1—8. This critical consideration forms a transition to the final chapter which is intended to be an elaboration of Blumhardt's thoughts about suffering and victory. Our object was to show that the defencelessness against suffering forms an essential element of it. Christ's resurrection means in principle the conquest of the power of death. Death has lost his sting, because the power of sin has really been conquered. This real, essential victory, however, belongs to the completion of Christ's work of salvation at the parousia. The mysterious secret of suffering is in essence not different from the mystery why we still have to pray for the parousia. This continuation of Blumhardt's trend of thought seemed necessary to us in order to show that, as we said in the introduction, Blumhart's method of working, in which he strictly adhered to the standards of Scripture, may serve as a salutary corrector to counteract all kinds of aberrations occurring in faith-healing circles. Every arbitrary anticipation of the conquest of death must almost inevitably lead to a misunderstanding of the reality of the victory of Christ. Perfectionism in the domain of sanctification often goes hand in hand with such arbitrary anticipation.

B. RIETVELD, *Saecularisatie als probleem der theologische ethiek inzonderheid in verband met gedachten van Dietrich Bonhoeffer en Friedrich Gogarten.* 's-Gravenhage, Uitgeverij van Keulen N.V., 1957 (274 p.). *(Saecularisation as a problem of theological ethics, particularly in connexion with some of the views of Dietrich Bonhoeffer and Friedrich Gogarten).*

By saecularisation the writer understands the emancipation of the world from the triune God. This view confronts us with the question as to the relation between God and the world. There is a demand for a clear statement of the nature of this relation. In theology, however, there is a revaluation of the church and the world. All that is understood by religion is subjected to sharp criticism. Is it possible to live in transcosmic communion with God without any form of religion? And, on the other hand, in its present stage of development the world is seen as emancipatel, having reached maturity. In this situation questions are raised as to the relation between the church and the world, and the former—divested of religion—approaches the latter, living perhaps in a state of unconscious Christianity.

The writer takes a stand against these views by pointing out the close communion with God, through the Holy Ghost, which Scriptural emancipation brings with it. Fully developed humanity means in the first place a new living up to what the first table of the law demands, viz. a love of God expressing itself in the forms of religion and furthermore it means going through the tension of the present and the future centuries seeking after the will of God, the obedience to which is possible, particularly in the most tense "secular" situations, in view of the promises of Christ concerning the Holy Ghost.

The writer co-ordinates Bonhoeffer's call for a religious christianity and Gogarten's views on emancipation and over against them he sets the demand of a conscious bond—strengthened by all the means of pure religion—with the triune God.

R. SOEDARMO, *In de wereld maar niet van de wereld;* een studie over de grondgedachten van Gogarten. Kampen, J. H. Kok N.V., 1957 159 p.).
(In the world and not of the world; a study of the basic views of Gogarten).

J. C. LOMBARD, *Die leer van die heiligmaking by Karl Barth.* Kampen, J. H. Kok N.V., 1957 (267 p.).
(The doctrine of sanctification in the theology of Barth).

In the Faculty of Law:

M. DE VRIES, *Bedrijfseconomische en fiscale winstbepaling in het bijzonder met betrekking tot de kosten der produktiemiddelen.* Arnhem, G. W. van der Wiel, 1956 (109 p.).
(Commercial and fiscal determination of profits, particularly in relation to the costs of the means of production).

After a few introductory observations this thesis gives a survey of the various views in business economics about the basis of the determination of costs, the apportioning of costs and the continuity of the undertaking.

Then follows a discussion of the demands which have to be made on the annual profits fiscally, apart from the ruling legal regulations. The conclusion is that the fiscal concept: annual profit demands an apportioning of the costs based upon objective standards, a regularity in the apportioning and a verifiability of the apportioning. By the latter principle the writer means that the undertaker by means of data, facts or circumstances has to give satisfactory proofs that the costs are present and the amount of these costs. In principle this is of importance in connexion with the costs for which no expenses have been made yet and which refer to the apparent risks of the untertaker. As to the basis of the fixation of the costs there is no reason to make fiscal demands for the determination of the annual profit. In principle there is, therefore, no objection to basing the costs respectively on the nominal, real or the concrete capital; the historical costprice, the historical costprice adjusted to the change in purchasing power of money or the replacement value of the means of production respectively being the standard in that case.

The Revenue has to reckon with the demand of continuity and for this the historical costprice theory is inadequate. Theoretically and practically respectively the doctrine of "the guilder is a guilder" is abandoned in both organic theories, but this is no objection and the principle of equal taxation, for instance, is not interfered with. The theory of the corrected costprice is unworkable in practice. Besides this theory will not always be sufficient for the maintenance of the continuity. For this reason the Revenue is to allow all undertakings to calculate the profit on a basis of the maintenance of the concrete capital (the complex of capital goods). The various methods (systems) leading to this are next discussed: lifo-system; lifo-system according to ministerial resolution, iron stock system; fixed value system and theory of replacement value. By means of examples the writer shows which system leads to a pure maintenance of the concrete capital with stocks remaining equal, in case of a surplus and of a shortage respectively. The thesis further gives a full exposition of the theory of the replacement value of Limperg c.s.; of the theory of money correction (Walb, Bakker and others) and a discussion of the views of modern business economists. The book is of special and topical value in connexion with the development the concept of fiscal profit shown in recent judgements of the Supreme Court of the Netherlands.

H. BIANCHI, *Position and subject-matter of criminology*. Amsterdam, North Holland Publishing Cy., 1956 (VIII, 216) p.).

In the Faculty of Medicine:

A. W. F. RUTGERS, *Lepra en tuberculose, een vergelijkende studie met behulp van huidreacties*. Zaandijk, Uitgevery der Firma J. Heijnis Tzn., 1956 (X, 217 p.).
(Leprosy and tuberculosis; a comparative study with the aid of skin tests with tuberculin, killed BCG and lepromin in South-African Bantus).

The purpose of this study was to acquire information on the immunological relationship between leprosy and tuberculosis, to support the theory that tuberculosis protects against leprosy. The results indicated that the late reaction to lepromin, produced in some tuberculin-negative healthy people, was slightly intensified and accelerated in patients with tuberculosis and still more in patients with tuberculoid leprosy.

The reaction to killed BCG was slightly but progressively accelerated by leprosy contact, active tuberculosis and lepromatous leprosy. Interesting was the result that amongst 54 tuberculoid leprosy patients 5 showed a positive tuberculin reaction together with a negative reaction to killed BCG.

The aforementioned acceleration and intensification of the late reaction to lepromin could be explained by a slight crosshypersensitivity between leprosy and tuberculosis. The results of this investigation point to the conclusion that it is improbable that the specific protective influence of BCG vaccination against leprosy will be important. Neither are clinical investigations of the protective value of BCG against leprosy very convincing. Hypothetically speaking a non-specific protection against leprosy by BCG cannot be ruled out altogether.

P. L. MEYER, *Hyperostosis frontalis interna in het syndroom van Morgagni*
Delfzijl, Uitgeverij der Firma de Vries, 1956 (83 p.).
(Hyperostosis frontalis interna in the syndrome of Morgagni).

A brief introduction elucidates the object of this thesis, which is the study of two aspects of the problem of hyperostasis frontalis interna on the basis of data from the literature and findings obtained by personal observation.

The two questions with which this investigation is concerned are: the clinical significance and the morphogenesis of hyperostosis frontalis interna.

In the first chapter a historical survey is given which shows that the clinical significance of these proliferations of the frontal bone became the centre of interest only in the course of the 20th century. Various investigators have pointed out that hyperostosis frontalis interna, obesity and virilism should be regarded as manifestation of a well defined syndrome. Stewart was the first author to point out that this syndrome is frequently seen in psychiatric patients. This observation has since been confirmed by several investigators, including Morel. This has given rise to the use of the term Morgagni-Stewart-Morel syndrome. Other investigators—e.g. Schneeberg, Woolhandler and Levine—have refuted this theory; on the basis of investigations covering a large series of cases they rearched the conclusion that the Morgagni-Stewart-Morel syndrome is not a circumscribed clinical entity.

In the second chapter a survey is given of the symptomatology as described in cases of Morgagni-Stewart-Morel syndrome. The often discrepant experiences of various investigators are discussed.

The various views on the pathogenesis of this condition are discussed in the third chapter. Distinction is made between seven categories, viz: general and localized circulatory disturbances, cerebral atrophy, Morel's traction theory, the infection theory, disturbances in calcium metabolism, a traumatic origin and the endocrine theory.

The fourth chapter deals with the literature on the correlations between hyperostosis frontalis interna, age and sex.

In the fifth chapter the literature on the pathological anatomy, and on the morphogenesis is discussed. The views on this aspect of the hyperostosis problem are likewise widely varied. Many investigators believe that hyperostosis frontalis interna is the result of irregular ossification in certain parts of the frontal bone. Morel believes that the proliferation originates from the diploe, whereas Calame's supposition is that the origin of the osseous proliferation should be found in proliferation of the tabula interna. Dressler submits satisfactory arguments in favour of his opinion that hyperostotic proliferations occur due to metaplastic ossification in the dura mater. His views are discussed in detail.

The sixth chapter concerns personal observations made in 411 autopsy cases collected from the psychiatric and neurological material of the "Valeriuskliniek" and the psychiatric institutes of the "Vereniging Veldwijk".

A complete autopsy was performed in all these cases. The age of the patients at the time of death is presented in a diagram. In regard to sex the series can be divided into two virtually equal groups, viz: 205 men and 206 women.

The autopsy revealed hyperostosis frontalis interna in eight of these cases, i. e. in 1.9 % of the series—a percentage hardly higher than the percentages given by Canavan and Freeman for non-psychiatric patients (1 % and 1.6 %, respectively).

In none of these eight cases was the Morgagni-Stewart-Morel syndrome seen. Only one female patient was suffering from obesity. In no case was virilism observed. Three patients showed neurological anomalies which could hardly be correlated with hyperostosis; two of these were suffering from epilepsy since childhood; the third patient showed reflex manifestations attributable to uraemic coma.

The psychiatric disorders were highly varied in nature. The only clinical pictures found were those identical with the pictures in the Kraepelin system, viz: manic-depressive psychosis, oligophrenia, involution melancholia and senile dementia.

The nature of these conditions does not suggest any correlation with the hyperostosis frontalis interna.

There was a striking uniformity of macroscopic findings at anatomical examination. The osseous proliferations were invaribly symmetrical in localization, spreading to immediately in front of the coronal suture.

The dura mater infiltrates, as it were, into the margins of the osseous proliferations. Only a small part of the dural fibres pass across the osseous proliferations as a thin membrane. The ramifications of the medial meningeal artery do not pass across the proliferations but disappear in small tunnels underneath their lateral margins.

An explanation of this macroscopic picture is found in the first case described. In this case it was clearly seen, both macroscopically and microscopically, that the osseous proliferations originate in the dura mater. The larger part of the dura, with the ramifications of the medial meningeal artery, was localized between the frontal bond and the osseous proliferations. Only a small part of the dural fibres passel across the surface of the osseous proliferations. In various preparations the part of the ura localized between the "hyperostosis" and the frontal bone was interrupted by a bony connection between the osseous proliferation and the frontal bone. Unmistakable alterations were seen in the osseous proliferation and also, to a lesser degree, in the frontal bone. Scattered proliferation of young stroma was seen in the medullary spaces of the osseous proliferations. Cells with bright ellipsoid nuclei and polynuclear osteoclasts were visible in this stroma. The trabeculae were affected in several places by the osteoclasts, which made contact with the dura mater in this manner.

The dura is absorbed by the osteoclasts and the resulting space is filled with the above mentioned young stroma, which is regarded as the matix for the osseous tissue to be newly formed.

In this first case, therefore, there was durogenous osseous proliferation which was engaged in adhering to the frontal bone in several places.

In the remaining seven cases the histological findings unmistakably suggested a similar process.

An outline of the morphogenesis of hyperostosis frontalis interna is presented on the basis of these findings.

W. F. VAN STEGEREN, *De betekenis van het klinisch psychologisch onderzoek voor een nadere analyse van de z.g. genuine epilepsie*. Amsterdam, Wed. G. van Soest, 1957 (96 p.).
(The meaning of the clinical-psychological research for a more extensive analysis of the socalled genuine epilepsy).

According to the literature of epilepsy, organic as well as psychic factors could play a part in the manifestation of epilepsy.

With a certain group of patients the first attack occurs during a critical situation in life, whereas in other cases the period, preceding the first attack, proves not to have a special signification for the patient.

Further it appears from clinical data about epileptic patients, that the EEG of some patients shows clear deviations, whereas the EEG of other patients is normal, or hardly disturbed.

On account of the organic resp. psychic conditions for development of epilepsy, specified in the literature, and in view of the above clinical experiences, the question rises whether psychological examinations can give us a more clear insight.

It is stated in the publications about the intellect of epileptic patients that there is a lower correlation between the frequency of the attacks, the gravity or the duration of the epilepsy and the intelligence quotient (I.Q.), than between the I.Q. and the age on the first attack. The I.Q. is higher as the age on the first attack is greater.

On the strength of these investigations we could suppose that a patient, who by origin is intellectually talented, offers more ,,resistance'' to the manifestation of the attacks, which we could call prognostically favourable.

When studying the Rorschach tests it appears that the results and events are not very satisfactory. Much attention is paid to the possibility to diagnose epilepsy on the strength of the Rorschachresults. The unsufficient selection of the material and the lack of a preliminary exactly described questioning are the cause of a difficult comparableness and manageability of the results of the various tests. A further adaptation of the Rorschach in epilepsy tests will only be possible, if other methods are seeked for in the handling of the data.

We advanced in our research from a group of 64 patients, suffering from "genuine" epilepsy; this group was divided in the following way:

a. patients with a disturbed EEG;
b. patients with a normal or "borderland" EEG;
c. patients with which the development of the attacks has not been influenced by a critical situation in life;
d. patients with which the attacks, at any rate the first one, were provoked by a critical situation in life;
e. patients with a disturbed EEG; without psychical provocation of the attacks;
f. patients with a normal or "borderland" EEG, with which the attacks, at any rate the first one, took place in a critical situation in life.

It was supposed that the testresults of patients of which organic factors are to the fore (group a. and c.), should be less good than when psychic factors play an important part (group b. and d.).

These hypotheses were supported by a statistical working up of three tests—Bourdon-Wiersma, Wechsler-Bellevue and Rorschach.

The third hypothesis was that when adding up together the organic (group e.), resp. psychic factors (group f.), the differences in the testresults of both groups increase. This hypothesis could also be supported.

The Wechsler profile proved to show the same course in the different groups. For the questions of general comprehension and for the block design, all the groups scored the highest points, for the digit span and for the object assembly they obtained the lowest points.

In the Rorschach group d. shows a greater lability than groep c.—more unadapted colour-answers, a greater number of unrestrained interpretations, such as "blood", "fire" and "explosion".

It may be supposed that these patients, of which anamnestically no emotional outbursts are known, will have an insult in their efforts to keep their emotional lability under control during critical situations in life.

In the results of own investigations we find a confirmation for the idea in literature, that a good intellect renders the prognosis for the epileptic patient more favourable.

Besides it is very probable that when during the psychological examination a patient proves to have a good intellect and gives an unstable Rorchach picture, this patient will have an insult in critical situations in life, whereas with bad intellectual performances and a stable Rorschach picture, this chance is slight. When deciding on the therapy, we will have to reckon with these possibilities.

There will only be sense in the clinical-psychological examination of patients suffering from a so-called "genuine" epilepsy:

1⁰ if we seek for an answer to clearly formulated questions, which are posed by the clinic, starting from the fact that the patient suffers from epileptic attacks; and

2⁰ if the groups of patients are arranged in such a way, that a statistically working up of the testresults in possible.

F. C. STAM, *Hystopathogenese en classificatie van cerebrale gliomen.*
Delfzijl, Uitgeverij der Firma de Vries, 1957 (111 p.).
(Hystopathogenesis and classification of cerebral glioma).

A brief introduction clucidates the object of this thesis, which is the study of the histopathogenesis of cerebral gliomas. In this study we will particularly consider of the ideas about the genesis of malignant tumors can be applied to the gliomas.

In the first chapter after the discussion of the theory of Cohnheim and Ribbert, a detailed survey is given of the experimental work of Deelman. After that the ideas of Nicholson and Willis are dealt with and finally the "two-stage-theory" of Berenblum is discussed.

The second chapter deals with the literature about the histopathogenesis of gliomas. Firstly the idea of Ribbert is described and after the related work of Ostertag.

Then follows a detailed discussion of the ideas of Scherer. This author can be considered as the founder of the modern study of gliomas. He concluded on morphological grounds that gliomas arise from pre-existent glial cells. He considered the peculiar forms of growth, which he called secondary structures, as important arguments for this thesis.

Willis has the same ideas with regard to the histopathogenesis of gliomas. His views are propagated in the Netherlands by Van Dam and Van der Horst. The experimental proof of the thesis that gliomas can arise from pre-existent glial cells is given by Selighman and Shear and especially by Zimmerman.

In the third chapter the classification of gliomas is discussed.

Ribbert's opinions are fully represented in the classical work of Bailey and Cushing. Several dubious points of their scheme are critized. For example the existence of the medulloblast, which is identical with the indifferent cell of Schaper is doubted. Then it is pointed out that in later years investigators have discovered that the spongioblastoma polare is identical with the astrocytoma fusiforme.

After the classification of Bailey and Cushing the schemes of Penfield, Del Rio Hortega and Chiovenda are discussed.

This is followed by a brief discussion devoted to the classification of Ostertag.

The classifications of Scherer and Willis are based upon the modern ideas about the histopathogenesis of gliomas. These authors consider that the several types arise from mature types of gliomas by anaplasia. The glioblastoma multiforme is no longer considered as an independant type of glioma, but as an anaplastic astrocytoma.

Kernohan and his fellow-workers have worked out this thesis. They pointed out that anaplasia also can occur in oligodendrogliomas and ependymomas. The oligodendrogliomas change by anaplasia into oligodendroblastomas.

Kernohan and his fellow-workers have divided the anaplasia into four grades.

Ringertz considers that it is possible for astro- and oligodendrogliomas as for the ependymomas to pass into glioblastomas by anaplasia.

He does not divide this anaplasia into grades, but distinguishes only intermediate forms between the mature types of gliomas and the glioblastoma multiforme.

Henschen confirmed the idea of Ringertz with regard to the oligodendroglioma. He found several oligodendrogliogenic glioblastomas in this cases.

The fourth chapter deals with our own study.

In the last chapter is pointed out that the dysembryogenetic theory cannot be correct. The widespread extension of several gliomas without any sign of expansion cannot be explained by the unicentric view.

Further arguments against the embryogenetic theory form the typical secondary structures (Scherer) and the malignant recurrences of astrocytomas.

Then our own conception is dealt with. The initial stage of genesis of gliomas, which consists of proliferation of astrocytes or oligodendrocytes in the midst of the pre-existent structures, cannot be considered as a tumor. In these fields of proliferation genuine gliomas can arise by further proliferation and dedifferentiation. These fields are therefore considered as pre-gliomas. We distinguish astro- and oligodendrocytic pre-gliomas and mixed forms. The genesis of gliomas is compared with the genesis of the carcinoma of Bowen. The astro- and oligodendrocytic pre-gliomas are compared with the hyperplasia of the epidermis, while the gliomas can be compared with the intra-epithelial foci of cancer.

Finally the consequences of this theory with regard to the classification are discussed.

In the Faculty of Science:

P. HUYER, *The determination of total cross sections for fast neutrons by a time of flight method.* 's-Gravenhage, Uitgevery Excelsior, 1956 (102 p.).

A time of flight method for the determination of total cross sections for fast neutrons has been realized by detecting neutrons twice along their path by stilbene scintillation counters. The time-interval between the pulses of the two counters is measured by a delarged coincidence circuit and determines the energy of the neutrons between the counters.

The experimental arrangement and its properties with respect to efficiency, energy resolution and background are discussed. The time resolution (from $6-9 \times 10^{-9}$ seconds) was not as low expected because the coincidence efficiency depended largely on the time resolution; which may be caused a. o. by the spread in transit time of the photomultipliers.

The method has been compared with different methods for fast neutron spectroscopy and has been shown to give comparable results. It has been tested by measuring with an average energy resolution of 20 % the total cross section of sulphur between 400 keV and 1200 keV.

P. BALK, *Preliminary investigations on the electronic spectra of aromatic hydrocarbon negative ions.* 's-Gravenhage, Uitgeverij Excelsior, 1957 138 p.).

J. BRUG, *Synthese en antirivale eigenschappen van gesubstitueerde acetophenonen.* 's-Gravenhage, Uitgeverij Excelsior, 1957 (102 p.).
(Synthesis and anti-rival properties of substituted acetophenona).

H. VAN KAMP, *Energetische grootheden van cyclanen.* 's-Gravenhage, Uitgeverij Excelsior, 1957 (56 p.).
(Energetic magnitudes of cyclana).

The physical and chemical properties of the many-membered ring compounds show a peculiar dependence on the ring size.

This problem was further studied by determining the heat of combustion of the cycloparaffins having from 10 up to 17 C atoms, in continuance of Kaarsemakers's investigation concerning the cyclanes from C_4 up to and incl. C_9.

The above-mentioned cycloparaffins were synthesized by subjecting highly purified dimethyl esters of a,w-alkane dicarboxylic acids to acyloin condensation. The yield of 2-hydroxycyclodecanone was considerably increased by decomposing the condensation product at a lower temperature than stated in the literature.

The cyclanes synthesized from the 2-hydroxycyclanones were purified by crystallization from methanol, sometimes after fractional distillation. The effect of the purification was read from time-temperature diagrams plotted during the melting of crystallized samples at least a few days old. To obtain comparable values for the energy level it was necessary to calculate the heat of combustion of the cyclanes in the ideal gas state. To this end the heat of evaporation or the heat of sublimation of these compounds were determined directly or indirectly.

The results led to the following conclusions:

a. The structure of cyclohexane in the rigid chair form is free from strain.
b. In all the cyclanes with more than 6 C atoms which have been examined strain occurs to some degree.
c. The cyclanes with medium-sized rings (8—11 C atoms) display considerable strain, so that the twelve-membered ring cannot be considered to belong to the medium-sized rings.
d. Of the medium-sized rings those of cyclononane and cyclodecane are subject to the greatest strain.

JOH. BLOK, *Radio-actieve besmetting van de biosfeer in Nederland.* Amsterdam, H. A. van Bottenburg, 1957 (176 p.).
(Radioactive contamination of the biosphere in the Netherlands).

This thesis contains a study on the radioactive contamination of the biosphere. The latter constitutes one of the most serious problems accompanying the extensive use of atomic energy and has become of immediate concern because of the widespread fall-out originating from the experiments with nuclear weapons.

Part I of thesis has a general character and deals with the radiation dose from natural radioactivity (chapter I), the presence of fission products in the biosphere (chapter II) and the possible hazards to public health of the increased dose level involved (chapter III). The conclusions can be summarized as follows:

1. The genetic effects to be expected from the radioactive fall-out are negligible.
2. The continued accumulation of ^{90}Sr in bone may lead to dose levels at which the possibility of delayed effects resulting from irradiation of the bone marrow cannot be ignored.
3. Inhalation of radioactive dust particles could give rise to relatively high local dosages. Our present knowledge is too limited to exclude ill-effects from this irradiation with certainty.

In part II the measurements of artificial radioactivity in air and rain-water are discussed, which were carried out in the Netherlands in the course of 1955 and 1956.

Chapter IV describes the methods for continuous determination of fission products in air and rain-water.

In chapter V investigations on the properties of the radioactive dust in the atmosphere are reported. From the measurement of the desintegration rate the date of explosion can be estimated (fig. 8 and 9). The absorption of the beta radiation in aluminium provides information on the composition of the mixture of nuclides (fig. 10, 12 and 13). A cascade-impactor has been used to estimate the particle diameter (tables XII, XIII and XIV). The activity of the individual particles has been assessed by autoradiographic methods (fig. 17 and table XV).

The correction for geometry and for absorption of beta particles in the sample and the window of the counter is discussed in chapter VI.

The results of the measurements of airborne and deposited radioactive dust are given in chapter VII. The values of the air activity are plotted in fig. 21. The monthly averages and peak values of airborne and deposited radioactivity are given in table XXII. Radiochemical analyses of rain-water has shown that the calculation of the ^{89}Sr fall-out based on the estimated age of the fission products gives approximately the correct value, whereas the figures resulting from calculation of the ^{90}Sr fall-out are too low (table XXVI). This can be explained by assuming that only part of the deposited ^{90}Sr originates from recent explosions.

O. KOOI, *Existentie-, eenduidigheids- en convergentiestellingen in de theorie der gewone differentiaal vergelijkingen*. 's-Gravenhage, Uitgeverij Excelsior, 1957 (101 p.).
(Theorems on existence, uniqueness and convergence in the theory of ordinary differential equations).

The well-known theorem of Picard-Lindelöf deals with the differential equation $y' = f(x,y)$, where the continuous function $f(x,y)$ on the region G satisfies a Lipschitz-condition:

$$| f(x,\bar{y}) - f(x,y) | \leq N | \bar{y} - y |, \quad (N > 0, \text{constant}).$$

We can formulate the conclusion of this theorem in three statements, which to a certain extent are independent:

1^0 $y' = f(x,y)$ has a solution through a given point $P(x^\circ,y^\circ)$ of G, (existence),
2^0 only one solution through P exists, (uniqueness),
3^0 each sequence of functions obtained by Picard's method of successive approximations converges uniformly to a solution, (conv. succ. appr.).

In this thesis the author intends to investigate the three statements mentioned (especially the third), using a method which has the advantage that it furnishes simultaneously the convergence of sequences of functions obtained by the Picard approximations (and of certain other seqences of functions), as well as the existence and uniqueness of solutions.

This method is analogous to that by means of which Koksma has given a simple proof of some classical theorems, among others the Picard-Lindelöf theorem. The results obtained in this way are therefore first of all of methodical interest, and the consequence is that not all the assertions of the proved theorems are new. For example, the statements concerning existence are included in more general existence-theorems, whereas the statements concerning uniqueness and convergence of successive approximations (or sometimes only the latter) may be considered to be new.

In the first chapter of this thesis the author gives a survey of the literature published before 1956 on the subjects mentioned by Peano (existence), Nagumo (uniqueness) and Van Kampen (conv. succ. appr.) for the case that the continous function f(x,y) satisfies the Nagumo-condition:

$$(x-x^\circ)\,|\,f(x,\bar{y}) - f(x,y)\,| \leqq |\,\bar{y}-y\,|, \quad (o \leqq x-x^\circ \leqq a).$$

For systems of finitely and infinitely many differential equations he gives some generalisations of the 'Nagumo' case. One of these generalisations proves to be a generalisation of theorems of Rosenblatt.

In the Faculty of Arts:

H. J. KOLKMAN, *Psychologische achtergronden van de verkeersveiligheid.*
Amsterdam, Drukkerij Holland N.V., 1956 (138 p.).
(Psychological backgrounds of road safety).

The results of a few measures and provisions on behalf of road safety are critically surveyed:

a. favourable results of the speed limit provided it has been fixed expertly.
b. favourable action of street refuges, traffic lines and striped crossings (examples are given of decimation of the number of accidents by simple measures);
c. favourable results of a psychological examination of drivers;
d. a few examples of favourable results of training and propaganda.

In the chapter on the psychology of traffic a psychology is successively given of the car driver, the cyclist, the mo-ped rider, the motor cyclist, the scooter rider and the pedestrian. Each category has its own, peculiar characteristics.

The phenomenon of the "accident proneness" is discussed in connexion with various psychic qualities and processes: attentiveness (discontinuity of consciousness), automation, presence of mind, sureness of instinct, fatigue. The influence of the wireless in the motorcar, alcohol, age, experience and sex is also discussed.

In dealing with the more complex concept of "accident liability" the non-personal factors of accidents are studied: some "illusions" which have led to accidents; the difference between the objective and the subjective danger of a traffic situation.

In the last three chapters ("Engineering", "Education" and "Enforcement") practical suggestions are made based upon the preceeding psychological observations and considerations.

In the section on Engineering the imperfection of the motor car is first discussed. The phenomenon of "car out of control" is examined in detail. With regard to accelerator and brake pedal solutions are suggested which may give less cause for intuitive reactions with wrong effect. As to lighting: Each category (bicycle, mo-ped, motor cycle, motor car) should have its own, normalised lighting. A shape which is more clearly perceptible in the city lights so that the whole width of the motor car can already be seen from a distance. The head lamps of the car (left hand or right hand lights) should have a character of their own, so that the whole of the car will remain better perceptible in case one lamp should drop out.

A few requirements that priority roads should comply with at crossings. Another form is suggested for the "zebras" which is to make the pedestrian look automatically in the right direction. Better traffic signs telling road users more at a glance (signs not based upon agreement, but on immediate, intuitive understanding). Investigations tending to improvements of roads, crossings etc. by the aid of tachistoscopic exposition of traffic situations. "Engineering" is defined as: The art of causing the subjective danger to be as great as the objective danger and to keep the latter as little as possible.

In the chapter on Education a standardised training method is suggested for drivers, many details of which are dealt with. As it has been statistically proved that between one and two years after the driving licence has been obtained there is an increased accident proneness it is suggested to give the first driving licence a validity of only one year and to demand a corrective training and examination after that year.

In the section on propaganda attention is paid among other things to the pedestrian. It appears that the risk of the pedestrian-non-driver is from fifty to a hundred times greater than that of the pedestrian who also drives himself (underestimation of the danger from ignorance). For this reason a film is suggested for the traffic education of pedestrians which shall make the spectator (pedestrian) believe that he is driving himself and which will make him realise the shortcomings of the car and the heavy demands imposed upon the attentiveness of the driver so clearly that he absorbs these quasi-experiences into his traffic intuition. This will make him a more cautious and sensible pedestrian.

Why do short safety actions (one day to one or two weeks) have a negative result *as a rule?* A psychological explanation of this phenomenon (also known to the safety inspectorate) is given. One of the remedies: one should never advertise *safety*, but *vigilance, attentiveness* etc.

Propaganda should never be vague and not rest on slogans. Schooling, clear instruction is better than a slogan which is, indeed, attractive but practically non-committal. A few examples are given. Also the building-up and duration of a safety campaign are analysed. Four phases: (1) slow initial period (2) carrying on with optimal intensity; (3) gradual decrease and (4) carrying on at the normal minimum. A good and successful safety propaganda should never stop but be carried on with a definite minimum intensity.

"Enforcement" (Law, inspection and control): The phenomenon that the legal concept "culpability" covers the notion "cause" very inadequately, is illustrated and explained by means of numerous examples. A lack of legal knowledge or of a knowledge of the regulations is, indeed, a general phenomenon, but is not the cause of accidents. In propaganda and traffic instruction, therefore, we should not insist on knowledge of the law, but on "traffic knowledge", and upon selfknowledge.

Motion attracts the attention much better than stationary contrast. This makes it desirable for the traffic sign, the baton or flag (in Holland the "pancake" of the children's brigade) to be moved up and down and not to be kept still.

It is not a question of limiting the present number of accidents *by* some points, but restricting it *to* a small percentage of what it is now. Road safety is to a very high degree possible. The promotion of road safety should for the whole country be in the hands of one central body. Only if all measures for road safety form a harmonious whole, can they mutually support each other and can they yield the highest return.

R. W. VAN DER GIESSEN, *Enkele aspecten van het probleem der predictie in de psychologie speciaal met het oog op de selectie van militair personeel.* Amsterdam, Swets & Zeitlinger, 1957 (XII, 247 p.).
(Some aspects of the problem of prediction in military psychology).

In this thesis the problem of prediction is studied for the selection and classification of military personnel. Reference is made to nearly two hundred studies on this subject, of which many are American. The author, formerly the head of the Selection Department of the Royal Netherlands Navy, acknowledges the valuable assistance of the Scientific Liaison Officer of the Office of Naval Research, U.S. Embassy in London, who made many recent unclassified research reports on the validation of military selection procedures available to the author.

The problem of the prediction of human behaviour implies many fundamental questions, some of which are as old as philosophy itself. Although the author principally rejects the strict determinism of e.g. Laplace, whose conception of the "ideal Mind" implies the perfect predictability of human behaviour, he does find evidence for enough "consistency" of behaviour to make prediction worth while in a practical situation like the military selection.

In military psychology the problem of finding reliable and relevant criteria is even more awkward than in industry. In this study "training results" are used to validate the selection procedure and the author stresses the disadvantages thereof but points out that more final criteria are either not available or too unreliable to be of much practical use.

In choosing, combining and weighting the variables the Wherry-Doolittle method is used and the experimental groups consist of 2501 men of the Royal Netherlands Navy: electricians, mechanics and engine-room personnel.

All results are cross-validated and the multiple-correlation coefficients, which range from 0.57 to 0.63 proved to be reasonably stable. They were significantly (5 % level) higher than the predictions of three judges, whose predictions were based on an interview and who had all testscores at their disposal.

The Dutch forces often use translated tests, but the author shows that translation causes changes in validity and reliability and item-analysis proves that item-difficulties are also liable to large changes after translation. It is argued that the large amount of experimental and statistical work, which is needed for validation and other operations, could be more efficiently done by a combined organisation for the three Dutch forces. This organisation should in the first place establish a close and constant co-operation with the military psychological organisations of the other NATO-members. In the author's opinion personnel research is somewhat neglected in the Netherlands and he feels that co-operation is as much needed in human relations as in the other fields of military research.

In the Faculty of Economics:

W. ALBEDA, *De rol van de vakbeweging in de moderne maatschappij.* Hoorn, Edecea, 1957 (268 p.).
(The rôle of the trade union in modern society).

The purpose of this book is to study the role of the trade-union movement in our modern society on the basis of the christian principles as underwritten by the protestant trade-unions in the Netherlands.

The first introductory chapter deals with society and organization. Society is an "ecosystem" of persons, organizations, groups, firms and the State united by many contracts. A common feature of society in all western countries is, what K. E. Boulding calls the "organizational revolution". Our economic system can no longer be described without detailed reference to the important role played by the organizations.

The labour problem can be rationalized to the feeling of the worker that he has no respected place in our society (P. F. Drucker, A. N. Whitehead, H. Reichhold).

Seen from an economic point of view, the trade-union can be defined as a "cartel" for labour. Though the element of truth behind this definition is recognized, it is argued that we have to go further; in particular the importance is stressed of the trade-union movement for the social emancipation of the worker. The protestant trade-union movement should be seen as an organization, which fulfils the function to lead the evolution of society. society.

From this starting point the development of society in the Netherlands is sketched, from a laisser-faire capitalism to a structure, interwoven by the organizations of workers and employers, with the rather unique feature of the split between catholic, so called "neutral" and protestant organizations on both sides. Special attention is asked for the growing role of the government in this structure. The government sanctions collective agreements and employers agreements, stimulates the development of an effective "organization of business" which safeguards codetermination by the workers and the restoring of order in economic life with a minimum of direct influence from the government. Furthermore the government has set up advisory bodies through which the social groups can advise the different governmental departments. This evolution implies all kinds of contacts between the government and the trade-union movement. In the Netherlands there are two ways for the trade-unions to try to influence the government: In the first place by direct contact, secondly by working through the political parties.

An eventual right of applying force to the government by strike action in case of differences of opinion between the state and the trade-union movement is denied by the protestant unions. To apply force of this kind to the state is a form of revolt, and can therefore be permitted only in case that a revolution is justifiable e.g. in case of a frustration of the conscience of the people.

In the third chapter the scope is considered that is given to a free trade-union movement in different society structures.

The syndicalist movement wants to hand all authority in the state to the trade-union movement. This means either an absorption of the state by the trade-union movement, e.g. anarchism, or an absorbtion of the unions by the state, e.g. fascism. The communist creed allows no scope to free trade-unions. The Russian unions are merely organs of the state. The social democratic view overemphasises the importance of the state in economic life, and allows therefore not enough scope for the independent functioning of the trade-unions.

The roman catholic idea of the corporate state, though it starts from the collective agreement as the conciliation of labour and capital, is subject to two dangers: In the first place roman catholic thought on state and society does not distinguish sharply enough state organs and "corporations", with the consequence that the independence of the corporations of the state is not safeguarded. Secondly as witnessed by "Quadragesimo Anno", pope Pius XI sees as an ideal, that the functions of the trade-unions are taken over by the corporations. The corporation is not based on the free social organizations, and leaves to these organizations only the education of employers and workers.

In the fourth chapter the development is sketched of the protestant view of business-organization. Starting point is the collective agreement as an expression of the solidarity between employers and workers. Ideal is a structure of society in which the questions of wages, conditions of work, the cooperation between the different firms within an industry, etc., are regulated by organs formed by, and based upon freely functioning trade-unions and employers' organizations, without or with a minimum of the use of naked power. The structure of the Dutch statute on the "public organization of business" of 1951 is analyzed from this point of view. Though some dangers are still ahead as a consequence of the influence of socialist and roman catholic thought on the realisation of this statute, a good possibility exists that a living organism based on freely functioning organizations can develop within the frame work of this law.

The fifth chapter very shortly deals with the role of the trade-union vis à vis the individual enterprise. Nationalization does not bring "industrial democracy" any further. British experience is discussed at some length in this respect. There is a tendency among management circles, to feel that when labour relations are good within the firm the trade-union should "keep out". This feeling is understandable, because the trade-union is a "stranger" within the firm. The manager prefers to deal with his own staff. The trade-union, however, cannot leave the labour relations within the firm to individual contracts, without loosing all contact with its members and therefore becoming unable to do its work in a broader field. Moreover, human nature being what it is, no management can do without an opposition. This is a natural function of the trade-union. Therefore the trade-union should organize itself in such a way that every firm and even branches within firms, has its own "local", so that the union no longer is a stranger, but an insider. The trade-union should leave their members in this respect as much responsibility and initiative as possible the formation of the firm as a unit of employer and workers on the basis of common solidarity.

Chapter VI gives an outline of wage theory.

Chapter VII contains an evolution of the Dutch national wage policy. This wage policy, it is concluded, has some outstanding merits: an inflation was avoided, and labour conflicts were minimized. Some unfavourable features should however not be overlooked: To the organizations of employers and workers not enough independence is left. The system is too highly centralized, and the wages in all industries are too rigidly bound to the "standardized system of job evaluation". For other considerations, for instance: the employment situation and the social climate within the industry, there was no room at all before the end of 1955.

The fact that all wage rates in collective agreements are maxima, leads to profits that are higher, and wages that are lower than necessary. Moreover, in cases of overemployment "black wages" led to the undermining of the authority of the law.

The changes in the system of the national wage policy proposed by protestant and roman catholic workers' and employers' organizations are discussed and approved. The power to lay down the general directions ("richtlijnen") for the wage policy will be removed from the Minister of Social

Affairs in Cabinet to the Social Economic Council (a tripartite organ with representatives of the three trade-union centres, the three employers' organizations centres and members appointed by the Crown. It becomes a task of a committee appointed by the Social Economic Council to sanction the collective agreements on the basis of norms derived from the general economic situation import, export, etc.. The hope is expressed that the development will go further in a direction of decentralization, and a higher degree of independence for the organizations of employers and employees in the different industries, without loosing the favourable features of a national wage policy. A certain degree of coordination of the general movement of wages is an absolute necessity in a modern full-employment—as well as underemployment—economy.

The last chapter sketches in brief two of the main implications of the development, known as "automation" for the trade-union movement: a rapid raise of productivity and the growing importance of salaried employees in our economic life.

G. J. STAPELKAMP, *De bedrijfsraad voor het bouwbedrijf*. Assen, Van Gorcum & Comp. N.V. — G. A. Hak & Dr. J. Prakke, 1957 (305 p.). *(The industrial council for the building industry).*

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HUMANISME, SCIENCE, ET RÉFORME
Pierre de la Ramée (1515—1572)

I

INTRODUCTION

Depuis la parution de l'ouvrage fondamental de Ch. Waddington (1855) sur la vie et les opinions de Ramus et du livre de P. Lobstein (1878) sur sa théologie, les recherches historiques et critiques au sujet de Ramus et du ramisme ont fait peu de progrès, de sorte que les remarques de M. P. Miller („There is crying need for a full study of Ramus and his influence") et de M. Bolgar („A fresh assessment of his importance is most urgently required") [1]) paraissent fort justifiées.

L'essai que nous présentons ici ne prétend pas être cette „pleine étude"; il ne veut que commencer un examen nouveau du ramisme en entamant quelques-unes des questions qui se présentent à propos de Ramus et de son école. Ainsi nous espérons inciter d'autres chercheurs à s'occuper des multiples problèmes dans le domaine de l'histoire et de la philosophie du ramisme, qui attendent encore un examen [2]).

Nous avons laissé de côté beaucoup de problèmes importants. Par exemple, l'on ne trouvera pas ici d'analyse exacte de la méthode didactique de Ramus en mathématiques [3]), ni un examen de sa logique [4]).

Les pages suivantes analyseront surtout l'aspect scientifique et mathématique de l'activité de Ramus, un aspect trop négligé jusqu'ici par ceux qui lui ont consacré des études. Nous avons mis l'accent sur le ramisme en tant que lien important entre l'humanisme littéraire des XVe et XVIe et l'empirisme scientifique des XVIIe et XVIIIe siècles. Nous pensons en effet que l'évolution naturelle de la conception humaniste de l'unité essentielle de la rhétorique avec la logique (que nous avons nommé „l'empirisme littéraire"), vers l'utilitarisme et l'empirisme de Ramus, finit par conduire à l'utilitarisme et l'empirisme baconien, qui ont exercé une grande influence sur la science et sur son intégration dans la culture moderne.

Nous avons insisté sur le fondement épistémologique de cet empirisme (la „raison naturelle" adaptée à la Nature) et après avoir analysé l',,astronomie sans hypothèses'' de Ramus, nous l'avons ramenée à ses principes philosophiques.

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[1]) R. R. Bolgar, The classical heritage, Cambridge 1954, p. 437.

[2]) Un résumé de cet essai fut le sujet d'une conférence sur „Ramus et l'empirisme scientifique au seizième siècle", faite au Colloque sur les sciences au seizième siècle, organisé à l'abbaye de Royaumont le 4 juillet 1957).

[3]) L'un de nos élèves prépare une thèse de doctorat sur ce sujet.

[4]) M. Miller en a donné un court et pénétrant exposé dans son livre cité plus bas

Les rapports entre la ,,liberté philosophique'' (liberté de la science) de Ramus et ses convictions religieuses sont examinés. Nous faisons ressortir que l'importance de Ramus pour les sciences exactes consiste en ce qu'il unit la tradition des savants et celle des artisans, ce qui nous permet de nous occuper des relations que l'on peut établir entre la technique, la science et la religion. Quant aux influences *littéraires* qui ont poussé Ramus vers ses conceptions utilitaires, il nous paraît que le Socrate de Xénophon, à l'encontre du Socrate de Platon, ait été la principale.

Enfin, nous avons comparé le caractère de la théologie, de la philosophie et de la science de Ramus aux idées de Bacon et de Paracelse sur les mêmes sujets.

Quant aux ramistes nous nous sommes limités à fournir quelques renseignements sur l'influence de Ramus sur les sciences exactes.

Une étude de Ramus et du ramisme peut contribuer à élucider la question de la transformation des sciences naturelles du Moyen Âge en science expérimentale et celle de l'influence de l'humanisme, de la Réforme et de la vie économique et sociale sur la genèse de la science moderne [5]).

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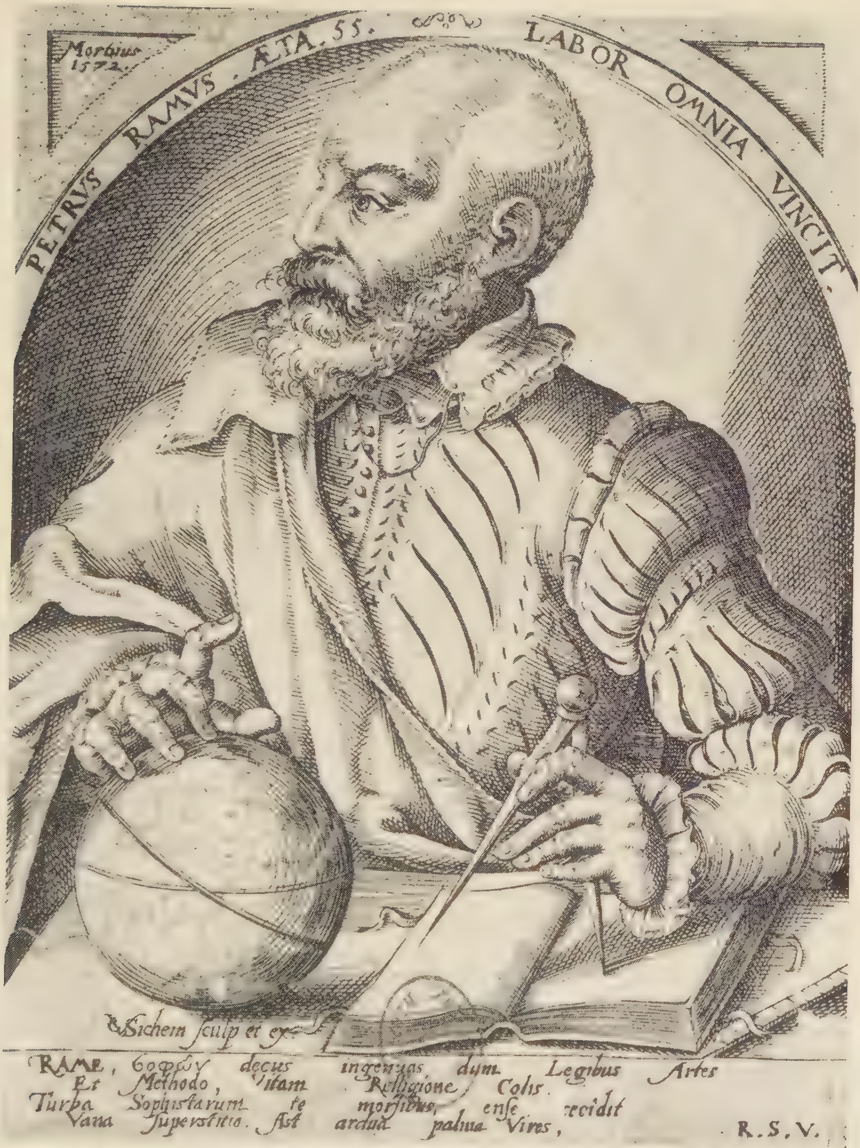
[5]) Nous avons, aussi souvent que possible, cédé la parole à Ramus même, en faisant des emprunts à ses ouvrages suivants:

Aristotelicae Animadversiones 1543.
Oratio de studiis philosophiae et eloquentiae conjungendis 1546.
Oratio pro philosophica Parisiensis Academiae disciplina (1550) 1551.
Oratio initio suae professionis habita 1551.
Arithmeticae libri tres 1555.
Dialectique 1555.
Praelectiones in P. Virgilii Maronis Georgicorum libros IV 1556.
Dialecticae libri duo 1556.
Prooemium reformandae Parisiensis Academiae, ad (Carolum) regem 1562.
Oratio de sua professione 1563.
Scholae physicae 1565.
Scholae metaphysicae 1566.
Actiones duae habitae in senatu, pro regia mathematica professionis cathedra 1566.
Prooemium mathematicum 1567.
Remonstrance de Pierre de la Ramée, faite au conseil privé 1567.
Geometriae libri septem et viginti 1569.
Scholae mathematicarum libri unus et triginta 1569.
Scholae in liberales artes 1569.
Basilea 1571.
Commentariorum de religione Christiana libri quatuor 1576 (posth.).
Collectaneae praefationes, epistolae, orationes 1577 (posth.).

Les ,,Scholae in liberales artes'', (Eusebius Episcopius et Nicolai F. haeredes, Basileae 1569), sont un recueil, fait par Ramus lui-même, de ses Scholae Grammaticae, Scholae Rhetoricae, Scholae Dialecticae, Scholae Physicae, Scholae Metaphysicae et plusieurs oraisons. Les Scholae Mathematicae ont paru séparément. Nous citons les Scholae physicae, les Scholae Dialecticae et les Scholae metaphysicae d'après cette édition.


Mortuus 1572.
PETRVS RAMVS . ÆTA. 55.
LABOR OMNIA VINCIT.
Sichem ſculp et ex.

RAME, σοφῶν decus ingenuas dum Legibus Artes
Et Methodo, Vitam Religione Colis.
Turba Sophiſtarum te morſibus, enſe recidit
Vana Superſtitio. Aſt ardua palma Vires,

R.S.V.

II

VIE DE RAMUS

La naissance de l'image du monde moderne, que l'on peut dater des années qui se sont écoulées entre l'activité de Nicolas de Cues et de Copernic d'un côté et de celle de Newton de l'autre, a été accompagnée de querelles des „modernes" contre les „anciens".

Le seizième siècle voulait rompre avec l'image du monde scolastique et „cherchait la terre promise des temps nouveaux"; cette recherche opposait coperniciens, paracelsistes et ramistes (auxquels se joignirent les cartésiens, les atomistes et les baconiens au dix-septième siècle) à l'aristotélisme, qui devait par ailleurs se rajeunir bientôt par suite de l'effort des jésuites et des scolastiques protestants.

Parmi les novateurs, le philosophe, pédagogue, et mathématicien Pierre de la Ramée (1515—1572) occupe une place importante. Son oeuvre de logique, la „Dialectique" (1555), oubliée depuis plus de deux siècles, connut plus de cent rééditions en cent ans et fut un des trois ou quatre ouvrages les plus influents du seizième siècle.

Pierre de la Ramée (de son nom latinisé: Petrus Ramus) naquit de parents pauvres à Cuts en pays de Vermandois près de Soissons. Il fit des études depuis 1527 à l'université de Paris, où il prit un dégoût pour l'enseignement scolastique des arts libéraux [1]). Mais en lisant Xénophon et Platon il se sentit sorti des ténèbres, et il résolut d'examiner la question de savoir si la dialectique platonicienne porterait plus de fruit en poésie, dans l'art de la parole et dans tous les autres domaines de la sagesse que la logique d'Aristote.

Il commença sa réforme avec la fougue immodérée, caractéristique des humanistes. En 1543 il fit paraître ses „Aristotelicae Animadversiones", un livre de „repréhensions sur Aristote", qui était une violente attaque. Ce livre fut condamné bientôt (1544) et l'on fit défense à son auteur d'enseigner et d'écrire sur la philosophie. Dès ce moment il s'appliquait aussi aux mathématiques.

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[1]) Ramus, Remonstrance au Conseil privé; voyez Ch. Waddington, Ramus, sa vie, ses écrits, et ses opinions. Paris 1855, p. 414. L'enseignement dans la Faculté des Arts comprenait l'étude des 7 arts libéraux, ceux du trivium (grammaire, dialectique ou logique, rhétorique) et ceux du quadrivium (arithmétique, géométrie, astronomie, musique). L'enseignement des arts du quadrivium était fort négligé, tandis que la logique occupait une place prépondérante.

En 1545 il prit la direction du collège de Presles, qu'il détint (du moins nominalement) jusqu'à sa mort. En 1546 il prononça un discours sur l'unité nécessaire de l'éloquence (rhétorique) et de la philosophie[2]), question qui constitue un des points du programme humaniste.

Après la mort de François I et l'avènement de Henri II, l'influence du cardinal Charles de Lorraine, qui protégeait Ramus, lui fit rendre la liberté de parler et d'écrire. En 1551 il fut nommé professeur d'éloquence et de philosophie au collège royal. L'enseignement de Ramus eut un succès énorme, ce qui, d'ailleurs, ne fit qu'augmenter la haine de ses adversaires conservateurs.

De 1551 à 1559 les travaux de Ramus furent consacrés aux arts libéraux du trivium; ensuite il voulait, avec la collaboration de ses élèves Jean Péna, Frédéric Reisner, et Arnaud d'Ossat, montrer l'usage qu'il fallait faire de sa nouvelle logique dans les arts mathématiques.

Sa conversion au protestantisme, qui date du colloque de Poissy (1561), lui fit perdre la protection du cardinal de Lorraine. Les dernières années de la vie de Ramus furent troublées par de violentes attaques des scolastiques et par les dangers des guerres civiles, qui l'obligèrent plusieurs fois à quitter Paris. Néanmoins, il déclina plus d'un offre d'une chaire universitaire à l'étranger.

De 1568 à 1570 il fit un voyage en Suisse et en Allemagne (Strasbourg, Bâle, Zurich, Heidelberg, Nuremberg, Genève, Lausanne). Pendant son séjour à Bâle il trouva enfin le temps de se dévouer presqu'exclusivement à la théologie. Le contact avec les théologiens bâlois et avec Bullinger et Josias Simler à Zurich, explique peut-être le caractère zwinglien de ses idées sur la Sainte-Cène. Le résultat de ses études fut publié après sa mort sous le titre de „Commentaires sur la religion chrétienne".

A son retour à Paris il trouva les protestants privés de leurs fonctions universitaires. Tout ce qu'il put obtenir c'était qu'on lui laissa le titre de principal du collège de Presles. En 1572, pendant les massacres de la Saint-Barthélemy, il fut assassiné à l'instigation de son ennemi furibond, Jacques Charpentier[3]).

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[2]) Oratio de studiis philosophiae et eloquentiae conjungendis.

[3]) Pour la vie et les oeuvres de Ramus la source la plus importante reste l'ouvrage cité de Waddington. Les livres plus récents de Ch. Desmaze (P. Ramus, sa vie, ses écrits, sa mort. Paris 1864) et de F. P. Graves (Peter Ramus and the Educational Reformation of the sixteenth century, 1912), n'y ajoutent que très peu.

III

L'HUMANISME

Son caractère conservateur. — Le retour à un passé lointain. — Paracelse. Copernic. — Les pères de la botanique.

L'humanisme fut d'abord un mouvement surtout littéraire et philosophique, qui se débattait énergiquement contre l'autorité d'Aristote, ou, du moins de l',,Aristote'' du Moyen Âge, et qui très souvent réservait à l'éloquence la place centrale occupée jusqu'alors par la logique. Peu à peu l'humanisme acquit cependant un caractère plus large et étendit son intérêt jusqu'aux sciences mathématiques et naturelles. En même temps le désir de dépasser les Anciens au lieu de les imiter seulement, se manifestait de plus en plus chez une certaine catégorie de penseurs au seizième siècle. Il serait inutile de faire une division nette entre les humanistes imitateurs des Anciens, et les esprits plus libres. Il s'agit de types qui ne se trouvent que rarement à l'état pur. L'humanisme est un mouvement de caractère ambigu.

Comme beaucoup de courants progressifs, l'humanisme est en même temps conservateur: allons en avant, désavouons le passé immédiat en nous référant à un passé plus lointain, aux vrais anciens, qui vivaient dans le siècle d'or quand l'homme était dans un état plus proche de la perfection et de l'innocence et se laissait guider encore par la sagesse. C'est ainsi que ceux qui ne se soucient point des autorités, les plus fougueux révolutionnaires, en résistant aux autorités en pouvoir ont l'habitude de se référer à des autorités plus anciennes, donc plus sages et moins corrompues. Mais en même temps ces autorités anciennes sont souvent si mal connues qu'il est facile de leur attribuer des idées chères à celui qui les allègue.

Ainsi Paracelse (1493—1541) qui ne sait comment assez exprimer son mépris pour Aristote en philosophie et pour Galien en médecine, parle avec déférence de Platon ou, encore plus, d'Hermès (qui était supposé plus ancien) et il prêche le retour à Hippocrate.

Même le renouvellement de l'astronomie par Copernic (1473—1543) commence par le désaccord avec Ptolémée, non que ses observations ne fussent pas assez exactes (Copernic ne prétendait jamais les surpasser), mais parce que le ,,punctum aequans'' était un péché contre la simplicité des mouvements célestes exigée par Platon. Et le début, le premier mouvement de la réforme copernicienne, c'est la recherche, dans la littérature classique, de systèmes qui s'accordent mieux avec l'idéal platonicien d'une structure simple, et, par conséquent, belle, de l'univers. C'est alors qu'il trouve des précurseurs parmi les très anciens Pythagoriciens, Hicétas et Ecphante, et Héraclide de Ponte qui supposaient le mouvement diurne de la terre, et Aristarque qui inventait un système héliocentrique. Et les traits de cosmologie platonicienne dans son chef-d'œuvre („Sur les révolutions des orbes célestes") sont si abondants que le livre pourrait être considéré après l'aristotélisme médiéval comme un retour à un platonisme plus ancien (et en même temps plus moderne).

Même les pères de la botanique, les Otto Brunfels († 1534), les Jérôme Bock (1498—1554), les Léonard Fuchs (1501—1566) et les William Turner (1508—1568), quoique prêchant le retour à la nature et à l'observation directe, ont la plus grande peine à se libérer de cette superstition de l'Antiquité. Le retour à la nature est souvent pour eux presque identique à une restauration de la science antique, non-corrompue par les commentaires et les additions du Moyen Âge. Ils donnent une description précise, fondée sur l'observation personnelle des plantes de l'Allemagne et de l'Angleterre, mais ils s'efforcent ensuite d'établir à tout prix leur identité avec des plantes décrites par Dioscoride.

Par conséquent, la nouvelle science très souvent prétendait n'être qu'une science très-ancienne, précisément comme la Réforme prétendait n'avoir fait que rétablir la première Église, non pas fondée sur la théologie et la corruption médiévale, mais sur la doctrine pure de la Bible. Et tout comme la Réforme marchait de pair avec l'humanisme, du moins quant à son intérêt pour le texte authentique de l'Ecriture, la *science* du XVIe siècle unissait ses efforts à ceux de l'humanisme pour le rétablissement des écrits authentiques de Ptolémée, d'Euclide, d'Héron et d'Archimède. On n'a qu'à se rappeler l'activité de Simon Grynée, de Willibald Pirckheimer, de Conrad Gesner, et de cent autres pour voir que le renouvellement de la science signifiait pour une grande part le rétablissement de la science antique.

IV

LA „PHILOSOPHIE LIBRE” DE RAMUS

Attaques contre l'autorité d'Aristote. — A. *La théologie et la philosophie.* — Attaques contre l'impiété d'Aristote et contre la pénétration de la philosophie dans la théologie, conflit avec Théodore de Bèze. — Critique immanente de la philosophie. — B. *Indépendance de l'autorité des philosophes.* — Le vrai Aristote opposé à ses continuateurs, au faux Aristote. — C. *La liberté philosophique.* — Attitude à l'égard de Platon et de Socrate. — Critique des autorités en science: Euclide. — Autorité de l'expérience. — Critique de l'autorité en religion; Beza. — La liberté spirituelle de Ramus. — L'autorité de Dieu.

Pierre de la Ramée correspond à plusieurs égards au type que l'on se fait traditionnellement de l'humaniste. Il réagit contre la tyrannie d'Aristote et contre l'enseignement scolastique, qu'il accuse de consister en de vaines „disputes", qui ne font progresser en rien l'entendement des choses. Après avoir étudié de la façon traditionnelle les livres de logique d'Aristote il tomba sur Platon et dorénavant il prêcha la révolte. À son examen de maître-ès-arts en 1536 il commença ses attaques contre Aristote en défendant la thèse téméraire: „Tout ce qu'a dit Aristote, n'est que fausseté"[1]). L'influence d'Aristote est pourtant considérable sur lui; il ne s'agit pour lui en fait, que de combattre l'aristotélisme de l'École, qui — contrairement à l'esprit aristotélicien authentique — érige le Maître en autorité infaillible. Le nom d'Aristote, nous dit-il, équivaut dans les écoles au mot „philosophe" et même au mot „philosophie"; sans son autorité rien n'est prouvé, personne n'est persuadé[2]).

Omer Talon, dont les idées sont à peu près analogues à celles de son ami et collaborateur Ramus, dit que les aristotéliciens vénèrent leur maître comme un dieu, et que réfuter Aristote revient, à leurs yeux, à rejeter la nature et la vérité. Il relève que l'irritation des aristotéliciens contre les „Aristotelicae Animadversiones", par lesquelles Ramus voulut les éveiller de leur sommeil, fut si grande, que certains d'entre eux avaient exigé le supplice du bûcher pour un tel crime[3]). Et Ramus lui-même constate, non sans indignation, que même des hommes pieux ont une telle révérence pour Aristote qu'ils doutent plutôt de Moïse ou du Christ que du philosophe grec[4]).

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[1]) „Quaecumque ab Aristotele dicta essent, commentitia esse." Waddington o.c. p. 28.

[2]) Dialecticae praefationes (septima); Petri Rami et Audomari Talaei Collectaneae Praefationes, Epistolae, Orationes. Parisiis 1577, p. 63).

[3]) Praefationes oratoriae et philosophicae (quinta); Collect. p. 127—128.

A. *La théologie et la philosophie*

Pour Ramus, au contraire, comme pour Luther, un argument très fort contre l'adoration d'Aristote dans un monde qui prétend être chrétien c'est précisément le paganisme du Stagirite. Il fait ressortir que les anciens docteurs de l'Église combattaient la philosophie païenne, dont Aristote était le représentant principal. En outre, les anciennes lois de l'Académie de Paris défendent de lire et de disputer, ou du moins exigent de réfuter, les passages impies des philosophes, tandis que nous, méprisant les prescriptions de nos aïeux, non seulement nous ne rejetons pas la philosophie d'Aristote, mais nous en faisons même le fondement de la religion chrétienne[5]). Nos aïeux combattaient les sophismes d'Aristote; les contemporains sont tellement dégénérés qu'ils le défendent obstinément[6]). Or, la philosophie païenne est fausse et impie quant aux problèmes de la matière première, de l'éternité du monde, de l'essence du cinquième élément, des intelligences des orbes célestes, de la félicité de l'homme dans ce monde. Il faut prendre soin de ne pas introduire le paganisme dans les écoles de théologie chrétienne sous le voile du christianisme. Il faut donc étudier les livres sacrés (l'Ancien Testament en hébreu, le Nouveau Testament en grec, ce qu'on néglige d'ordinaire) et non pas les questionnaires extraits de la philosophie païenne de Platon et d'Aristote[7]).

Ramus veut donc, comme Erasme, Lefèvre d'Étaples et tant d'autres humanistes chrétiens, le retour à une théologie pure, fondée sur l'Écriture Sainte comme la règle suprême et non mélangée avec la philosophie grecque, ni celle d'Aristote, ni même celle de Platon.

Cependant il recommande d'ajouter toujours, dans les commentaires, des passages tirés des Anciens aux textes sacrés, afin d'en rendre la lecture attrayante et afin de montrer que des traces de la religion chrétienne se trouvent chez les païens, sans que à côté de la Parole de Dieu il attribue pour autant la moindre autorité à ceux-ci[8]).

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[4]) Scholae physicae (praefatio); Coll. p. 73.

[5]) Oratio pro philosophica disciplina (1550); Collect. p. 338.

[6]) Schol. phys. lib. VIII C. 1 col. 787.

[7]) Prooemium reformandae Parisiensis Academiae ad Carolum Regem; Collect. p. 488—489.

[8]) Commentariorum de religione christiana libri quatuor; Francofurti 1576; praef. l. I. p. 2; Voyez aussi: P. Lobstein, Petrus Ramus als Theologe. Strassburg 1878, pp. 69—77. D'ailleurs les parallèles sont chez les païens, d'après l'opinion de Ramus, souvent mêlés à de graves erreurs doctrinales. Lobstein p. 73.

Dans les livres d'Aristote sur la physique et la métaphysique il y a, d'après Ramus, peu de théologie, mais ce peu est plein d'impiété épicurienne, et il se demande si l'Allemagne et la France sont tout à fait dépourvues des Luther, des Bucer, des Oecolampade, des Zwingli et des Calvin, qui puissent enseigner la doctrine évangélique sans que la jeunesse soit imbue de dogmes pervers et impies par ce métaphysicien pseudo-prophète? 9)

Quant à l'Éthique, Ramus préférerait la voir enseignée par un théologien érudit et pieux à partir de l'Évangile et non pas par un philosophe se basant sur Aristote. Car en lisant celui-ci la jeunesse peut apprendre beaucoup d'impiétés, telles que l'idée de la béatitude de l'homme provenant de lui-même, celle de la capacité de l'homme d'atteindre à toutes les vertus sans l'aide de Dieu, la négation de la providence de Dieu, la mortalité de l'âme, tandis que l'on ne trouvera pas un mot dans ses œuvres sur la justice divine 10). Évidemment ce sont là toutes des objections que les anti-aristotéliciens médiévaux et Luther avaient déjà avancées avant lui.

Avec Ramus, Omer Talon accentue qu'Aristote a beaucoup d'erreurs en commun avec Épicure 11) (le plus détesté des philosophes anciens!) et, comme presque tous les humanistes, il lui oppose Platon, opposition qui est évidemment à l'avantage de ce dernier: Platon enseigne que Dieu a créé le monde (!), ce qui est sa gloire suprême, mais les disciples crédules d'Aristote le nient, car Aristote est de l'avis contraire; Platon

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9) „An Germania Galliaque Luteris, Buceris, Oecolampadiis, Zwingliis, Calvinis destitutae sunt, a quibus evangelicam theologiam perdiscant, nisi et metaphysicus iste pseudopropheta juventutem perditis atque impiis dogmatis imbuat?" Praefatio, Scholae in liberales artes, Basileae 1569.

Il y a deux choses intéressantes à remarquer ici: d'abord, l'omission de Mélanchthon de la liste des grands réformateurs. Cela ne nous semble pas être le fait du hasard. La vénération de Mélanchthon pour Aristote a dû déplaire à Ramus, qui. d'ailleurs, semble avoir été critiqué par Mélanchthon, car Ramus se vante de n'être pas entré en dispute avec lui („nil ingenii et doctrinae per universam Germaniam principi Melanchthoni respondi". Act. math. sec. Collect. p. 551.

Deuxièmement: la préface des „Scholae in liberales artes" est insérée comme la première des „praefationes oratoriae et philosophicae" dans les Collectanea, sous le titre „Rami de conjungenda eloquentia cum philosophia" (Collect. pp. 90—98) (ne pas confondre avec l'oraison „De studiis philosophiae et eloquentiae conjungendis" de 1546). Mais là, les réformateurs sont remplacés par des pères de l'église („an Germania Galliaque Cyprianis, Augustinis, Hieronimis destitutae sunt, a quibus evangelicam theologiam perdiscant" (Collectanea . . . Parisiis, apud Dionysium Vallensem, 1577. Cum privilegio Regis p. 97). C'est que la situation de Ramus à Bâle en 1569 était toute différente de celle de son exécuteur testamentaire Nicolas Bergeron et de l'imprimeur Denis du Val, qui désirèrent obtenir le privilège royal à Paris en 1576).

10) Oratio pro philos. discipl. (1551); Collect. p. 337.

11) Collect. p. 119.

reconnaît que la providence de Dieu gouverne le monde, les crédules d'Aristote le nient; Platon croit que l'âme est immortelle, Aristote dit le contraire; Platon enseigne que l'homme tient sa félicité de Dieu, Aristote l'attribue à l'homme lui-même[12]. „O Platon ignorant!", s'exclame Ramus ironiquement, „ô simple Zénon! vous qui avez proclamé si consciencieusement la providence et la bienfaisance divines envers les hommes. Aristote se moque de votre théologie et la juge fabuleuse"[13].

Ramus, qui se plaît pourtant souvent à mettre le „vrai Aristote" en contraste avec l'Aristote „sophiste", n'est enclin à aucun compromis en ce qui concerne la théologie aristotélique: il n'y voit rien d'acceptable et il se moque des vains efforts de ceux qui „font un chrétien déguisé du païen Aristote"[14]. Le dieu d'Aristote n'a pas créé le monde, il ne s'en soucie point mais le meut comme un aimant meut le fer; il n'est pas bon, ne montre pas de charité et de bienfaisance envers l'humanité; il ne gouverne pas, il ne crée rien de nouveau. Et Ramus fait un appel aux théologiens pour écarter cette théologie athée de leur enseignement et de rétablir l'évangile, afin que dans les écoles de théologie et dans les sermons „ne soit pas cité le philosophe païen et athée, mais Moïse, mais Christ"[15].

Ramus se plaint de ce qu'on l'appelle ennemi de la religion parce qu'il avait dénoncé les impiétés d'Aristote, ce qui, d'ailleurs, avait déjà été fait de la même manière par l'Université en 1271[16]. On l'a condamné il y a 25 ans, dit-il en 1562, parce que, une fois l'autorité d'Aristote réfutée, l'autorité de la théologie serait réfutée aussi. Les premiers chrétiens qui combattaient les faussetés aristotéliques, furent traités de fanatiques, de furieux, et d'impies par les païens aristotéliciens; et les mêmes offenses reviennent lorsque les „premiers chrétiens" sont vexés de nouveau et considérés comme des fanatiques, des furieux et des impies par les chrétiens d'aujourd'hui postérieurs, inspirés, eux aussi, par le paganisme d'Aristote[17]. Évidemment Ramus avait la conscience de n'avoir pas rompu avec la continuïté de son passé en embrassant la réforme: les humanistes évangéliques s'identifiaient également aux chrétiens primitifs.

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[12] Praef. orat. et phil. quinta Audomari Talaei; Collect. p. 120. Ramus, Oratio initio suae professionis; Collect. p. 426. Ramus, Comment. relig. christ. lib. I.

[13] Schol. metaphysicae, lib. XII, c. 9; Schol. lib. col. 969.

[14] Schol. phys. lib. VIII, c. 1; Schol. lib. artes, col. 788.

[15] Schol. metaph. lib. XIV, c. 6; Schol. lib. col. 996.

[16] Oratio init. profess.; Collect. p. 426.

[17] Schol. phys. lib. VIII, c. 1; Schol. lib. col. 788.

Malgré leur préférence pour Platon, Ramus et Talon reconnaissent que même le platonisme, tout pieux qu'il est, n'est pas un fondement pour la religion chrétienne. Ramus critique l'habitude de l'université de Paris où tout l'enseignement théologique se fait par des „disputations" sur des questions empruntées à la philosophie païenne de *Platon* et d'Aristote [18]) et Omer Talon fait ressortir que dans les choses divines on a plus de certitude par la foi que par toutes les „disputes" philosophiques; dans la philosophie humaine il faut connaître afin qu'on croie, dans les choses divines qui sont au-dessus de l'intelligence humaine, il faut croire d'abord, afin que l'on connaisse après [19]).

En théologie Ramus et son ami veulent donc un retour non pas à quelque philosophe grec, mais à l'Écriture Sainte. Cela est plus conforme à l'esprit de l'humanisme qu'il ne le semble à première vue: c'est encore un retour aux sources, si cher à tout l'humanisme. La Sainte Écriture règle suprême de la foi et de la morale: cela veut dire restauration de la vérité de l'Évangile et de la doctrine du premier siècle de l'ère chrétienne, qui fut véritablement „un siècle d'or" [20]), tandis que le nôtre peut à peine être appelé un siècle de fer [21]).

Il est remarquable que Ramus, en condamnant le mélange de la théologie chrétienne et de la philosophie, continue la critique des théologiens du XIIIe siècle à propos de la question de la pénétration de la philosophie aristotélicienne à l'université de Paris [22]). En poursuivant cette tradition, Ramus est d'accord avec les préréformateurs et les réformateurs. Mais tandis que Mélanchthon, après une courte période d'aversion à l'endroit de la philosophie d'Aristote (environ 1520) [23]), avait changé d'opinion et avait inauguré la scolastique protestante en Allemagne, et tandis que Théodore de Bèze déclara sa „résolution arrêtée de suivre le sentiment d'Aristote, sans en dévier d'une ligne, soit dans l'enseignement de la logique, soit dans le reste de nos études" [24]), Ramus resta ferme dans sa répudiation de toute théologie qui cherchait de l'appui dans la philosophie humaine et même païenne. Son principe de n'admettre aucune influence philosophique dans la construction d'une théologie chrétienne, lui fit repousser les termes peu scripturaires de „substance" et „substantiel", admis dans la définition de la doctrine de la Sainte-Cène par le synode réformé de la Rochelle (1571) sous l'influence de Bèze[25]). Il est d'avis que la théologie doit parler le langage biblique et éviter de le corrompre par nos termes sophistiques[26]).

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[18]) Prooem. reform. acad. Paris; Collect. p. 488.

[19]) Praef. orat. quinta Audomari Talaei; Collect. p. 120.

[20]) Ramus, Epistola ad Carolum Loth. Card. 11 Kal. Nov. 1570; Collect. p. 257.

[21]) Comm. relig. christ. l. IV, 19. 344.

[22]) Cf. R. Hooykaas, Science and Theology in the Middle Ages, Free Univ. Qu. 3 (1954) nr 2. D'ailleurs au XVe siècle Jean Gerson (1402) et Pierre d'Ailly, bien qu'aristotéliciens en philosophie, protestèrent encore contre la pénétration de la philosophie dans la théologie. Cf. E. Gilson, La philosophie au moyen âge. 3 ed. Paris 1947, p. 716.

[23]) Cf. K. Hartfelder, Ph. Melanchthon als Praeceptor Germaniae, Berlin 1889, p. 74—75.

[24]) Bèze à Ramus le 1er déc. 1570; Wadd. o.c. p. 229.

Il faut relever, cependant, que si Ramus ne veut pas adultérer la théologie chrétienne en la mêlant avec la philosophie païenne, il réfute également l'emploi de la théologie chrétienne dans la solution de questions scientifiques et philosophiques[27]). Du point de vue méthodologique Ramus est un adversaire de la confusion des disciplines diverses. Il fait ressortir que nos ancêtres n'ont pas adoré Aristote comme un Jupiter, ainsi que le font ses interprètes d'aujourd'hui, mais il ne veut pas utiliser leurs arguments à eux contre Aristote, tout probants qu'ils sont, mais seulement des arguments logiques, mathématiques et physiques, c'est à dire des armes scientifiques[28]). Et à la fin de ses „Études sur la physique" il répète qu'il n'a pas combattu les sophismes de la „Physique" d'Aristote par des arguments empruntés à l'Écriture Sainte, ni par l'autorité de Moïse ou du Christ, mais par des arguments philosophiques: là où il démontre qu'Aristote était en erreur, il l'a fait non parce que celui-ci était en conflict avec notre religion, mais parce qu'il s'opposait à la vérité logique, mathématique, physique[29]).

Ramus, comme beaucoup d'autres humanistes chrétiens, avait donc deux graves objections contre la théologie scolastique, l'une d'inspiration humaniste, l'autre d'inspiration chrétienne, à savoir: 1° la pénétration de la dialectique et de la méthode de la logique dans la théologie; 2° la pénétration du paganisme dans la théologie *chrétienne*, qui découle du caractère plus ou moins païen de la philosophie grecque.

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[25]) Cf. la lettre de Ramus à H. Bullinger, Sept. 1571; Waddington o.c. p. 433.

[26]) „. . . loquamur verba sacrae Scripturae, utamur sermone Spiritus sancti . . . Denique divinam sapientiam linguamque sophistica et infantia nostra ne corrigamus". Comm. relig. christ. IVb, 18, p. 343.

[27]) Il ne veut pas que le théologien ne sache pas la philosophie — au contraire — mais il faut maintenir les frontières: „Sed fines disciplinarum regi volo: statuoque tam sophisticum et captiosum esse in Theologorum scholis de Philosophia, quam in Philosophorum auditoriis de Theologia disputari". Prooem. ref. Paris. Acad.; Collect. p. 488.

[28]) Schol. phys. praef.; Collect. p. 74.

[29]) Schol. phys. lib. VIII, c. 10; Schol. lib. col. 826.

B. *Indépendance de l'autorité des philosophes*

Malgré sa critique, son attitude envers Aristote varie souvent et dépend considérablement de l'occasion. Il était nécessaire de miner l'autorité absolue d'Aristote afin de faire place à la liberté philosophique, mais, ceci fait, Ramus, comme la plupart des humanistes, fut prêt à opposer le vrai Aristote aux scolastiques: pour la question des „universaux", par exemple, il renvoie à Aristote, „le plus en harmonie avec le sens commun et avec l'usage" [30]). Il prétend même qu'il a été condamné par les aristotéliciens parce qu'il suivait Aristote: quel temps! on appelle et tient pour philosophes aristotéliciens ceux qui non seulement ignorent la philosophie d'Aristote, mais de plus la méprisent et la rejettent et qui calomnient et chassent des écoles son adhérent et admirateur (c. à. d. Ramus!) [31]).

A beaucoup de points de vue il est resté aristotélicien. Si l'on lui eût reproché cette affinité, il aurait répondu sans doute que par sa vraie philosophie il avait restauré le vrai Aristote [32]).

Il rend grâce à Dieu de lui avoir donné de si bons capitaines qui l'ont conduit après tant de tempêtes (des doutes de la scolastique) dans le port (de la vraie dialectique), à savoir: Galien, Platon et Aristote. Depuis ce temps il rapporte, dit-il, toutes les définitions aux lois d'Aristote, et il émet le vœu que l'on maintienne dorénavant en logique les lois et les principes d'Aristote et que l'on y cherche de nouveau le salut et la dignité de l'art [33]). La scolastique, qui est une „enfance", avait obscurci la logique d'Aristote [34]), et lui, Ramus, a écarté beaucoup de faiblesses de la logique d'Aristote, qui y ont été introduites par ses disciples ignorants [35]). Pour sauvegarder la réputation des grands philosophes de l'Antiquité il fait donc parfois usage de l'artifice de déclarer non-authentiques leurs opinions quand elles lui déplaisent!

Naturellement Ramus n'a pas la naïveté de penser qu'il est toujours d'accord avec l'Aristote authentique. En cas de désaccord il se sert d'un autre artifice: il fait ressortir qu'Aristote est en contradiction avec lui-même et il oppose le „vrai" Aristote à un Aristote qui n'est pas fidèle à lui-même. À Galien, à Platon, Ramus se déclare reconnaissant, et encore plus à Aristote, parce qu'il lui a enseigné la matière et la forme de la logique par ses Analytiques postérieures. Entraîné par cette lecture, Ramus avait relu tout l'Organon mais y avait trouvé de graves défauts par rapport à ses propres principes et lois [36]). Dans le cas de Platon Ramus se servit d'ailleurs du même artifice [37])

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[30]) Schol. metaph. lib. I, c. 5; Schol. lib. col. 847—848.

[31]) Oratio pro phil. discipl.; Collect. p. 368.

[32]) „... logicae facultatis compendium, tum diuturnis votis ab academia Parisiensi flagitatum, ad Aristotelis mentem, atque adeo salutem et honorem constitutum habebimus". Dialect. praef. secunda; Collect. p. 49.

[33]) Schol. dialect. l. IV, c. 16, col. 157.

[34]) „... scholasticam infantiam quibus Logica Aristotelis tam vehementer obscurata est". Praef. dialect. sept.: Collect. p. 61.

[35]) Les livres, attribués à Aristote, „commentarii potius et imperitis ex Aristotelis philosophia deducti, quam vera Aristotelis philosophia esse videretur" (ibid.).

Dans les „Scholae Physicae" la Physique d'Aristote est rarement louée et continuellement critiquée. Ramus s'efforce d'y montrer les inconséquences d'Aristote et très souvent il juxtapose un texte dans lequel Aristote soutient l'opinion „vraie" et un autre où il est dans l'erreur. Mais après cette accusation violente et continue il termine le „livre second" en disant, absolument de bonne foi, que presque toujours il n'a opposé à Aristote que d'autres sentences, plus vraies, du même Aristote; qu'il n'a fait que lui opposer les lois suprêmes d'Aristote, celles qui étaient le plus éprouvées par lui-même [38]). Certes, si la controverse était décidée par „l'Aristote sommeillant", il serait envahi par une infinité d'arguments, mais c'est le vrai Aristote, qu'il demande en juge, l'Aristote tout éveillé par le son d'une cloche de bronze et converti de tout son cœur aux lois suprêmes. Il est sûr que ce jugement le ferait triompher; la même chose se passerait également, si Aristote pouvait revivre aujourd'hui et donnait son jugement encore plus excellent qu'autrefois, et qu'il vît que nous avions usé du même zèle et de la même liberté philosophiques en considérant *ses* livres, que ceux dont il usait en considérant les livres d'Anaxagore, d'Empédocle, et surtout de Platon; lorsqu'il verrait que ses lois nous sont tellement saintes et augustes; lorsqu'il s'apercevrait que nous sommes fidèles non pas à ses mots et écrits (non linguae vel manus), mais à son esprit [39]). Il est d'avis que si un autre Aristote succédât à Aristote, toute sa critique serait superflue, toute la physique aurait été exposée tout autrement [40]).

Quelquefois Aristote est loué hautement et Ramus le propose alors en exemple à ses contemporains. Après une diatribe contre la déification des corps célestes par Aristote, il ajoute: „ce philosophe païen s'est montré ici plus pieux qu'un grand nombre de chrétiens, qui mettent dans leurs temples des images visibles et grossières de la Trinité, que l'esprit même a peine à concevoir"[41]). Et quand il s'agit de l'application pratique des mathématiques Ramus place Aristote au-dessus de Platon[42]) et il dit même que, à cet égard, de tous les philosophes qui vivent et qui ont vécu, Aristote est le plus libre en philosophie et aimait le plus la vérité[43]), tandis que Platon a montré en cette matière un grand „aveuglement"[44]).

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[36]) Schol. dialect. l. IV, c. 16, col. 156. Cf. plus bas V, B.
[37]) Voyez plus bas IV C et VII B.
[38]) Schol. phys. lib. VIII, c. 10; col. 826.
[39]) Schol. phys. lib. II, c. 2; col. 687.
[40]) Schol. phys. lib. III, c. 1; col. 693.

C. *La liberté philosophique*

Mais Ramus n'a pas l'intention de suivre ou de rejeter aucune autorité sans discrimination; il va juger chaque opinion selon ses propres mérites. Il dit que dans les livres de Platon et d'Aristote il y a beaucoup de sentences inconsistentes sur les mêmes sujets, et qu'ils ne sont pas toujours fidèles à eux-mêmes: „Ni Platon n'est toujours Platon, ni Aristote Aristote"[45]). Ramus prend la liberté de choisir ce qui lui convient des doctrines de Platon. Après avoir critiqué sévèrement Platon et Archimède, il s'efforce de montrer qu'ils sont enfin partisans de son utilitarisme[46]) et que c'est là „le vrai Platon, animé de l'esprit platonien"[47]). Il sait donc, malgré son indépendance spirituelle, corroborer ses opinions par des citations habilement choisies dans les œuvres de Platon ou même d'Aristote.

Omer Talon appelle les philosophes des marchands de sagesse: „C'est pourquoi, s'il y a quelque chose dans les écrits de Platon qui me convient et m'est utile, je l'accepte; s'il y a quelque chose de bon dans les jardins d'Épicure, je ne le déteste pas; si Aristote vend quelque chose de meilleur, je l'accepte; si les marchandises de Zénon sont plus vendables que celles d'Aristote, je quitte Aristote pour me rendre au magasin de Zénon; si toutes choses qui se vendent dans les boutiques des philosophes, sont vaines et inutiles, je n'y achète rien du tout"[48]).

Conforme à cette attitude nous voyons Ramus tantôt critiquer Aristote, tantôt le louer. La liberté philosophique demande, selon lui, qu'on puisse parler librement pour ou contre tout le monde et qu'on puisse approuver certaines choses en Platon, Zénon, ou Démocrite, et en désapprouver d'autres [49]).

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[41]) Schol. phys. lib. VIII, c. 10; col. 824; Schol. metaphys. lib. XII, c. 8; col. 965.

[42]) P. Ramus, Scholarum mathematicarum libri XXXI, a Lazaro Schonero recogniti et emendati. Francofurti 1599, p. 20.

[43]) Schol. math. p. 21.

[44]) Schol. math. p. 28.

[45]) Schol. math. p. 53.

[46]) Schol. math. p. 29, 50.

[47]) ib. p. 50.

[48]) Praef. orat. et phil. (quinta) Audomari Talaei; Collect. p. 133.

Il engage les physiciens à abandonner leur opinion traditionnelle sur le philosophe suprême et à s'approprier „un jugement logique et libre", à comparer les arguments aux arguments, les choses aux choses [50]), et il se moque complaisamment de Simplicius, le commentateur d'Aristote, qui s'était décidé à ne jamais dévier d'Aristote. Comme Galilée après lui, il fait des calembours sur la simplicité de Simplicius [51]). Il fait ressortir que c'est précisément en suivant Aristote d'une manière servile que Simplicius s'éloigna le plus de lui, tandis que Théophraste, le successeur immédiat d'Aristote, qui, pour des raisons scientifiques, dévia de son maître était par là même fidèle à l'esprit de son enseignement. Pour Aristote, Platon lui était ami, Socrate lui était ami, mais le plus de tous, la vérité lui était amie. Et Aristote, quoiqu'il n'eût pas raison contre Anaxagore, Empédocle, Platon et toute l'Antiquité, était libre envers elle. Par conséquent, celui qui reconnaît la liberté d'Aristote, louera en philosophie les philosophes chacun à cause de son mérite seulement et il mettra la vérité au-dessus de tous les philosophes [52]).

Le seul philosophe dont Ramus se proclame disciple est Socrate, parce que suivre Socrate ce n'est pas s'asservir à un système quelconque, mais s'engager à suivre le vrai, le beau et le bien au-dessus de toutes les opinions des hommes.

Certes, Platon lui est beaucoup plus sympathique qu'Aristote, mais s'il aime Platon, il n'est pas son esclave. Après avoir énuméré tous les avantages que la philosophie de celui-ci présente, il conclut qu'il ne suit pas *son autorité,* mais *la vérité* de Platon [53]). Quelqu'un a écrit que Ramus adhérait à la méthode de Platon et rejetait celle d'Aristote, mais Ramus répond qu'il adhère à la vraie méthode partout où elle est trouvée chez n'importe quel philosophe [54]). D'après Ramus, la vraie méthode ne se trouve exclusivement dans aucun des grands systèmes philosophiques.

La préférence pour le platonisme chez Ramus et Omer Talon s'explique parce qu'ils trouvent *la liberté* la plus grande dans la philosophie de Platon. D'après Talaeus „l'Académie est la maîtresse de la modestie, la protectrice de la liberté; les Académiciens sont peu nombreux, parce qu'il y a peu d'hommes d'un jugement ferme et constant et parce que la majorité fuit l'effort d'apprendre et de connaître" [55]).

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[49]) Oratio initio suae professionis; Collect. p. 407.

[50]) Schol. phys. l. VIII, c. 10; col. 827.

[51]) „O simplicissime Simplici, et Aristotelis magistri dissimile..." Schol. phys. l. III, c. 1, col. 693.

[52]) Schol. phys. lib. III, c. 1; col. 693.

[53]) Oratio init. profess.; Collect. p. 418.

[54]) Préface des Scholae in liberales artes; Collect. p. 95.

Ramus est un homme libre; s'il est nécessaire il va seul son chemin, sans aucun support d'autrui, se fiant seulement à son propre jugement. C'est cette indépendance qui rend impossible la tentative de le faire rentrer dans un cadre précis sans se heurter à des difficultés insurmontables. D'après lui il faut se conformer à la vérité, à la nature, et non pas au nom et à l'autorité d'un philosophe [56]); il préfère „être un philosophe plutôt que d'être l'esclave d'un philosophe" [57]); il faut retourner à la „liberté philosophique", c'est le seul remède qui permette une restauration et un développement rapide de toutes les sciences [58]).

Il est donc fort éloigné de la nouvelle servitude de ces humanistes-là qui remplaçaient l'autorité d'Aristote par l'adoration superstitieuse de quelqu'autre philosophe ancien ou de l'Antiquité en général. Il se dirige vers l'avenir; le passé classique n'est là que pour aider à trouver la voie de la libération de l'esprit; le retour aux classiques, ce n'est que reculer pour mieux sauter. Il n'y a donc rien d'étonnant en ce qu'il critique non seulement Aristote, mais aussi les nouveaux saints de l'humanisme littéraire, Cicéron (qu'il admire) [59]) et Quintilien [60]) et même l'évangile des mathématiciens, les Éléments d'Euclide, quoiqu'en général son attitude soit moins hostile à leur égard qu'elle ne l'est d'ordinaire envers Aristote. D'après Ramus, Euclide ne contient pas d'erreurs de doctrine, mais il commet des erreurs de méthode. Et même l'oracle infaillible des médecins, Galien, tant admiré par lui, exige des corrections [61]).

Pour Ramus les temps nouveaux ont commencé lorsqu'après la chute de Constantinople Bessarion, Gaza, etc. sont venus en Italie et en France :„Alors la lumière divine des temps nouveaux, par l'activité des lettres nouvelles, a rayonné sur nous par eux, les anges de Dieu" [62]).

En vrai humaniste il tient l'étude et la connaissance des auteurs classiques pour indispensables à la floraison des sciences. Il faut qu'un professeur de mathématiques sache le grec et le latin et qu'il soit versé dans les ouvrages d'Euclide, d'Archimède, d'Apollonius, de Pappus, de Ptolémée[63]). Mais, d'autre part, il demande aussi que ce professeur soit non seulement capable de puiser les mathématiques à ces sources, mais aussi de les amender, corriger, améliorer et de les rendre plus faciles[64]). Et ensuite, Ramus fait ressortir nettement qu'une seule expérience, même d'un homme „qui ignore les lettres", vaut mieux que l'autorité de toute l'Antiquité: „Une sagesse unanime de tous les sages anciens disait que des cinq parties du monde, trois sont inhabitables; les deux extrêmes sont rigides par la froideur, la moyenne est torride par la chaleur. Mais, l'expérience des marchands et des navigateurs illettrés a réfuté cette sagesse". De telles erreurs se trouvent dans chaque discipline; toutefois: „La vraie et ancienne philosophie a été de ne rien croire légèrement d'un philosophe quelconque, quelque excellent qu'il soit, de ne consentir à rien, mais de chercher des choses plus aptes et plus congruentes à la vie humaine"[65]). Cela veut dire que mieux vaut s'en remettre à des doctrines conformes à l'usage humain, à l'expérience, qu'à l'autorité des savants les plus célèbres!

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[55]) Praef. orat. et phil. quinta; Collect. pp. 125—126.
[56]) Scholae physicae (praef.); Collect. p. 76.
[57]) Collect. p. 77.
[58]) Collect. p. 76.
[59]) Cf. Wadd. p. 352.
[60]) Cf. Wadd. p. 70.
[61]) Praef. phys. tertia; Collect. p. 84.
[62]) Orat. pro phil. disc.; Coll. p. 362.

Ramus est un esprit libre qui s'est affranchi non seulement du joug de la scolastique, mais aussi (du moins en principe) du joug de l'Antiquité, et qui va se libérer du joug de l'église romaine sans se soumettre aveuglément à la nouvelle église. Même après sa conversion au protestantisme, il s'oppose à la „contre-réforme" protestante aussi bien qu'à la contre-réforme des jésuites. En voulant transférer à l'assemblée des fidèles une partie du pouvoir des consistoires et des ministres, il défendit la liberté de l'église contre Théodore de Bèze (1571—'72)[66]).

Pour Ramus la liberté chrétienne conduit inévitablement à la liberté philosophique (dont Béza avait également empêché l'épanouissement), une liberté qu'il ne se laisse ôter ni par les théologiens, ni par l'autorité des philosophes. Ramus aime Platon, mais il n'hésite pas à le critiquer; il n'a pas beaucoup de sympathie pour Aristote, mais il le loue chaleureusement quand l'occasion se présente et même il le place, (ne serait-ce que rarement), au-dessus de Platon; il préfère l'Antiquité à la scolastique, mais parfois il accepte la tradition médiévale contre les

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[63]) Coll. p. 540.
[64]) Ibid.
[65]) Act. sec. math.; Collect. p. 540.
[66]) Cf. Wadd. p. 241.

Anciens. Il est converti au protestantisme après le colloque de Poissy (1561), où participèrent Théodore de Bèze et le cardinal de Lorraine qui l'avait protégé contre la fureur de ses ennemis: ainsi son adhésion à l'église réformée lui fit perdre son plus puissant protecteur et conduisit finalement à l'assassinat en 1572. Mais il ne gagna pas l'amitié de ce même Bèze, parce qu'il lui résista dans la question de la Sainte-Cène et des droits de la congrégation des fidèles et l'irrita par ses critiques sur Aristote. En dernier ressort Ramus ne reconnaissait que l'autorité de Dieu; il pouvait dire en vérité: „mon âme est toujours demeurée libre; elle ne s'est jamais vendue ou dégradée ..." 67).

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67) Oratio init. profess.; Collect. p. 427. „... animo tamen nunquam servus fui, animum nunquam despondi, vel abjeci".

V

LA RAISON NATURELLE ET L'USAGE

A. *La raison naturelle chez Ramus.* — Suivre la raison c'est suivre la nature; ce principe se trouve chez Socrate. — Cela signifie suivre l'usage. — L'exemple des sciences. — Les trois étapes de toute science. — La logique de Ramus est une logique d'humaniste ainsi qu'une logique d'empiriste. — B. *Ramus, l',,usuarius''.* — — La découverte de la méthode socratique. — Programme d'une philosophie à la socratique. — Définition des arts libéraux. — Unité des arts libéraux et illibéraux. — C. *L'empirisme littéraire.* — L'empirisme littéraire de Ramus, de Rodolphe Agricola et de Sturm. — L'empirisme de Louis Vivès. — La réforme pédagogique. — La transition de l'empirisme littéraire à l'empirisme scientifique chez Ramus. — La méthode naturelle dans l'enseignement; son invention par les artisans.

A. *La raison naturelle chez Ramus*

Ramus ne reconnaît qu'une seule autorité en science, à savoir celle de la raison: ,,Nulle autorité n'est au-dessus de la raison; c'est elle, au contraire, qui fonde l'autorité et qui doit la régler'' ¹), et en suivant la raison et en s'appliquant à penser librement, il espère voir un nouveau siècle d'or: guidé par cette liberté, un siècle suffirait peut-être pour mener jusqu'à la perfection tous les arts, qui, depuis qu'une servile indolence a envahi les écoles, sont connus pour une millième partie à peine ²).

Cette confiance optimiste en l'avènement prochain d'une science achevée, avènement qui n'aurait pour condition que la volonté des hommes de se laisser conduire par la raison, nous rappelle les philosophes du XVIII-e siècle. Aussi, son rationalisme a plus d'affinité avec la raison pratique, ,,la nature qui seule est bonne'', du XVIII-e siècle qu'avec la raison théorique et autonome de Descartes. La ,,raison'' des humanistes est ,,la nature humaine'' qui, corrompue en matière de foi et de morale, a gardé beaucoup de sa splendeur originelle dans le domaine de la philosophie. Quitter les préjugés, les autorités et les traditions formelles et se laisser guider par la *nature*, voilà le remède apte à effectuer la restauration des sciences. Selon Ramus, les grands philosophes, Platon et Aristote, les grands médecins, Hippocrate et Galien, les poètes et orateurs, Virgile et Cicéron, Homère et Démo-

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¹) Schol. math. l. III, p. 78.

²) Scholae phys. praef.; Collect. p. 76: ,, . . . ista libertate duce omnes omnium generum artes vel uno seculo a talibus artificibus et invenire, et absolvi possint: quae tamen nescio quot secula posteaquam servilis inertia in scholas nostras invasit, vix ac ne vix quidem parte millesima intelliguntur''.

sthène, ainsi que les grands mathématiciens, se sont tous laissés guider par cette méthode seulement, qui „préside aux mathématiques, à la philosophie, aux jugements, et à la conduite de tous les hommes", c'est-à-dire le principe de suivre la raison [3]). C'est donc la raison pratique, s'exprimant dans *l'usage* non-sophistique des arts dans la vie quotidienne.

Ramus trouve ce principe déjà énoncé par Socrate. Car, dit-il, selon Socrate il n'y a que les artisans qui connaissent leur art par la tradition transmise par les mains, par les exemples, l'exercice et l'usage, qui participent à une certaine sagesse [4]); la fin des arts ne consiste pas en des définitions philosophiques, mais en la connaissance des artifices et en leur opération et action [5]). Dans sa Remonstrance au Conseil Privé (1567) Ramus élabore les idées de Socrate: „Entre les grandes et admirables parties de la sagesse de Socrate, une fut qu'il maintenoit que tous les arts libéraux se debvoient rapporter à la vie humaine, pour faire l'homme plus avisé à bien délibérer et plus prompt à bien exécuter, et qu'il y avoit ès escoles trop d'enseignemens et de livres, trop de subtilités et d'argoteries sans utilité, sans usage; que pour estre nautonnier, maçon, laboureur, n'est point assez de sçavoir parler des règles de nautique, de maçonnerie, de labourage, mais qu'il falloit mettre la main à l'œuvre, et bien naviger, bien maçonner, bien labourer; que les mathématiques (qui estoient pour lors les arts plus traictez et celébrez) se debvoient ainsi démonstrer, l'arithmétique pour bien nombrer, la géométrie pour bien mesurer, l'astrologie pour la nautique, pour la médecine, pour l'agriculture, pour toutes choses naturelles sur lesquelles l'empire du ciel peut commander" [6]).

C'est pour lui non seulement un principe socratique, mais un principe de la *nature*, donc le plus ancien de tous, car *l'emploi* des arts est plus ancien que la *théorie* [7]). L'emploi de *l'arithmétique* en commerce, dans l'échange de poids et mesures, en physique (pour déterminer les alliages des métaux); l'emploi de la *géométrie* pour la mensuration, l'architecture et les fortifications; l'emploi de *l'astronomie* pour la nautique [8]). Ici l'humaniste Ramus, qui tire de l'art lui-même les règles de l'art, est d'accord avec le simple potier Bernard Palissy (1510—1590), qui, un peu plus tard, ne se lassera pas de répéter que „la practique a engendré la théorique" [9]).

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[3]) Schol. math. l. III, p. 78.

[4]) Après avoir considéré le problème d'où trouver la sagesse, Socrate arrive aux artisans: „En mon for intérieur, j'avais conscience effectivement, pour ainsi dire, rien connaître, je savais bien en revanche devoir trouver chez ceux-ci des gens connaissant quantité de belles choses. En quoi je ne fus pas trompé: ils connaissaient (au contraire) des choses que je ne connaissais point, et, sous ce rapport, ils étaient plus sages que moi". (Platon, Apologie 22 D; trad. L. Robin, éd. de la Pléiade, Paris 1950).

[5]) Oratio initio profess.; Collect. p. 422—423.

[6]) La Remonstrance de Pierre de la Ramée, faite au conseil privé, en la chambre du roy au Louvre, le 18 de janvier 1567, touchant la profession royalle en mathématiques, Paris 1567; Wadd. p. 414.

[7]) „. . . mathematum quae tum praecipue ferebantur, cognitionem illam, quidem imprimis ingenuam et liberalem, sed usum potiorem esse et antiquiorem". Schol. math. lib. III, p. 73.

Dès le commencement Ramus a posé ce principe fondamental qu'il y a trois formes successives de toute science: la nature, l'art et l'exercice. En dialectique, la nature c'est la raison ou la faculté naturelle de raisonner; l'art se compose alors des préceptes pour bien user de cette faculté, et l'exercice consiste à mettre en pratique les préceptes de l'art, afin de les convertir en habitudes. Par conséquent, en dialectique, dit Ramus, il faut d'abord découvrir comment la nature procède dans l'emploi de la raison et considérer, parmi tant de milliers d'hommes, ceux qui l'emportent par leur habileté. Supposé qu'ils aient à donner leur avis dans la discussion d'une affaire, leur pensée, comme un miroir fidèle, donnera une image de la nature. Ensuite il faut examiner ce qui se passe dans leur esprit pour arriver à leur conclusion, et voir comment ils expriment leur pensée par ordre et avec méthode, en descendant de l'idée la plus générale aux cas particuliers qu'elle comprend. Il faut donc étudier les leçons des esprits d'élite, où elles sont comme innées: puis les transmettre dans l'ordre le plus naturel et tracer des règles à ceux qui se proposent de bien raisonner. C'est ainsi qu'après avoir été l'élève de la nature, la dialectique en deviendra pour ainsi dire la maîtresse [10]).

La logique raméenne est donc à la fois une logique d'humaniste [11]), et une logique d'empiriste! Une logique d'empiriste, parce que, pour fonder une vraie dialectique, il recommande l'observation de la nature humaine; une logique d'humaniste, parce que, dans la pratique, il ne l'observe que dans les écrivains classiques. Représentant typique d'une époque de transition, il balance entre son indépendance moderne et sa vénération humaniste de l'Antiquité.

Pareillement, Ramus croit que la restauration de l'astronomie consiste en une *observation* assidue de la nature (des mouvements des astres), mais aussi en ce qu'on retrouve la *méthode* ,,naturelle'' des anciens Égyptiens et Babyloniens; il croit en général et en accord avec beaucoup de ses contemporains, que le siècle d'or qui va venir restaurera à beaucoup d'égards la situation presque idéale et ,,naturelle'' d'un passé lointain.

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[8]) Ibid.

[9]) B. Palissy, Discours admirables de la nature des eaux et fontaines... (Paris 1580), Advertissement aux lecteurs; Oeuvres de B. Palissy, éd. Anatole France, Paris 1880, p. 166.

[10]) Ramus, Dialecticae partitiones (1543); Waddington o.c. pp. 368—369.

[11]) Comme l'a dit fort justement Ch. Waddington, o.c. p. 347.

Il faut donc trouver les principes d'un art en étudiant ses applications, et en dressant un système à partir de l'usage. Car c'est la nature qui est bonne et qui a guidé inconsciemment les artisans, et il faut seulement appliquer la nouvelle logique aux autres arts tels qu'ils se sont développés par l'usage pratique, afin de les perfectionner. L'on comprendra qu'à cause de l'insistance sur l'application pratique Ramus fut surnommé l' *,,usuarius''* par ses adversaires.

B. *Ramus l',,usuarius''*

Ramus voulait réformer les arts libéraux, d'abord ceux qu'il appelait ,,exotériques'' (la grammaire, la rhétorique, la dialectique), ensuite les arts ,,ésotériques'' (ou ,,acroamatiques''): les mathématiques, la physique (comprenant l'acoustique, l'optique et l'astronomie) et la métaphysique, afin de les rendre plus ,,utiles'', plus conformes à l'usage. Ainsi Ramus se déclare disciple de la nature et de Socrate. Il raconte, comment, quand il vint à Paris, il tomba dans ,,les subtilités des sophistes'', et comment on lui ,,apprit les arts libéraux par questions et disputes, sans m'en jamais monstrer un seul autre ny profit, ny usage''. Mais, après avoir été ,,gradué'' comme maître-ès-arts, ,,comme conduit par quelque bon ange'', il lut Xénophon, et puis Platon, où il fit la connaissance de la ,,philosophie socratique''. Comme épris de joie il mettait en avant que les arts libéraux n'étaient pas bien enseignés par ,,des questions et des ergos, mais que toute sophisterie délaissée, il en convenait expliquer et proposer l'usage'' 12).

Dans ses Scholae Dialecticae il donna une version un peu différente. Il dit qu'il tomba sur le livre de Galien, ,,de decretis Hippocratis et Platonis'', et il s'étonna qu'en parlant de la dialectique, Galien, quoiqu'il adore Hippocrate comme un dieu, ne lui compare pas Aristote (que Ramus avait cru le premier des philosophes dans cet art), mais Platon. Alors il se mit à lire tous les dialogues de Platon qui traitent de dialectique et il s'aperçut que le ,,Socrate'' de ces dialogues élevait ses auditeurs au-dessus des préjugés des hommes ,,afin de les rendre

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12) Remonstrance; Waddington o.c. p. 415.

à la justesse (naturelle) de leur esprit et à la liberté de jugement". Ensuite il se dit à soi-même (à autrui lui eût été pénible), „pourquoi pas socratiser un peu?" Et il se demanda si, peut-être, Aristote nous a déçu par son autorité et s'il était en vain que lui, Ramus, s'était donné tant de mal à cueillir des fruits d'un sol aride et stérile[13]. Mais, chose remarquable, il semble à cette occasion que Ramus était encore plus reconnaissant à *Aristote* qu'il ne l'est à Platon pour lui avoir montré les défauts de la scolastique aussi bien que ceux d'Aristote lui-même[14].

Ramus fait ressortir comment, après ses mésaventures et sa rehabilitation par le roi Henri: „je me mis en toute diligence de traicter les disciplines à la socratique, en cherchant et démonstrant l'usage, en retranchant les superfluitez des règles et préceptes. En ceste laborieuse et pénible contention d'estude, j'ay travaillé jour et nuict à enseigner et mettre en meilleur ordre la grammaire grecque, latine, françoise, la rhétorique et surtout la logique, instrument singulier à manier et traicter tous discours, soient de quelques faits particuliers qui se puissent offrir, soient de plusieurs intelligences universelles accouplées avec les autres et toutes tendantes à mesme fin, comme sont les matières subjectes en toute discipline. Les premiers ans de ma profession ont esté employez en ces premières sciences. Puis s'en est ensuivy par ordre la mathématique ès nombres et grandeurs, qui est l'arithmétique et géométrie, en quoy est présentement du tout occupé le cours de nos veilles et labeurs; et s'il plaist à Dieu me donner la grâce de tirer ceste charue encore quatre ans, je m'asseure de rendre bon compte de la tasche qui m'a esté assignée par le bon roy Henry, et au bout des vingt ans, d'avoir satisfait par tout debvoir à la profession des artz libéraux"[15].

D'après Ramus les sciences sont contrôlées par l'usage, elles prennent leur source dans l'usage et elles ont leur but dans l'usage. Par conséquent, Ramus voit l'essence des arts à ce point dans leur pratique, qu'il les définit par leur application[16].

La logique est l'art de bien raisonner (bene ratiocinari, bene disserendi),

la rhétorique l'art de bien prononcer un discours (bene dicere)[17],

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[13] Schol. dialect. l. IV, c. 16, col. 155.

[14] Voyez plus haut IV B et plus bas VIII B.

[15] Remonstrance; Wadd. p. 415.

[16] „... ex suo fine defineretur mathematica ars". Schol. math. l. IV p. 108.

[17] Cf. Mélanchthon: „Rhetorica vero est ars, quae docet viam ac rationem recte et ornate dicendi". Hartfelder, o.c. p. 221.

la grammaire l'art de bien parler (bene loqui),
l'arithmétique l'art de bien compter (bene numerare),
la géométrie l'art de bien mesurer (bene metiri)[18]),
l'optique l'art de bien voir (bene videre),

et même la théologie n'échappe pas à une définition utilitaire, quand il dit qu'elle est la doctrine de bien vivre (doctrina bene vivendi). Le but de la théologie est, selon lui, éminemment pratique[19]); son livre posthume sur la religion chrétienne, bien qu'orthodoxe en dogmatique, accentue nettement la morale chrétienne: „la fin de la doctrine n'est pas la connaissance des choses qui y appartiennent, mais l'usage et l'exercice"[20]).

Il s'ensuit de cette conception pratique des arts, que Ramus reconnaît à peine la distinction alors courante entre les arts libéraux et les arts mécaniques ou illibéraux, les premiers appartenant aux savants, les derniers aux artisans. Dans sa „Geometria" (1569) il fait ressortir que la fin de la géométrie est de „bien mesurer", et que „cette fin apparaît avec beaucoup plus de splendeur dans l'usage et dans les œuvres géométriques que dans les préceptes et les règles, comme on voit les astronomes, les géographes, les géodètes, les navigateurs, les mécaniciens, les architectes, les peintres, les statuaires faire usage de rien d'autre que de la géométrie dans la description et le mesurage des astres, des pays, de la terre, des machines, des mers, des édifices, des tableaux, tout comme la grammaire, la rhétorique, la logique sont observées plus pleinement et abondamment dans leur usage par les poètes, les orateurs, et les philosophes que dans les prescriptions des grammairiens, des rhéteurs, des logiciens"[21]).

C'est pourquoi Ramus n'est pas content de la division du quadrivium en arithmétique, géométrie, astronomie, et musique (c-à-d. théorie de la musique!). Les mathématiques étant appliquées en astronomie, Ramus ne veut pas séparer l'astronomie des mathématiques, car on ne sépare pas non plus la grammaire et l'usage de la grammaire[22]).

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[18]) Cf. Geometria, lib. I, p. 1 (éd. 1627); Schol. math. lib. III, p. 73; la préface de la Dialectique (1553) (éd. franç.): „... grammaire et rhétorique pour bien parler et orner la parolle, arithmétique et géométrie pour bien compter et mesurer ... la dialectique, art général pour inventer et juger toutes choses". Cf. Wadd. p. 402.

[19]) Cf. Prooemium ref. Acad. Par.; Collect. p. 490.

[20]) „Theologia est doctrina bene vivendi ... Finis doctrinae non est notitia rerum ipsi subjectarum, sed usus et exercitatio". Comm. relig. chr. I, c. l. p. 6.

[21]) P. Ramus, Arithmeticae libri II et Geometriae XXVII ... a Lazaro Schonero recogniti et aucti. Francofurti 1627; Geometria, liber I, p. 1).

[22]) Schol. math. l. IV, p. 109.

C. L'empirisme littéraire

L'insistance sur la science appliquée et sur l'usage en appelle à notre goût moderne pour la technique. Mais ne nous trompons point: le contraste avec l'humanisme littéraire n'est pas si absolu qu'il ne le semble d'abord et Ramus l',,usuaire'' ne contredit pas Ramus l'humaniste. Comme tous les humanistes, Ramus est surtout mécontent de la prédominance, dans l'enseignement, de la logique ordinaire, dont la pratique consiste en discussions pour le plaisir, pour l'art de disputer, en jeux de mots qui doivent servir à aiguiser l'esprit sans but pratique. Il veut que la logique soit utile à la vie quotidienne, qu'elle nous amène à *parler* logiquement, et non pas à ériger un système de logique qui suffit à soi-même: ,,nous ne croyons pas que la logique ait été inventée pour disserter sur les préceptes de la logique'' [23]). La logique ne doit pas être séparée de son application dans le discours de l'homme, elle ne peut pas être séparée de l'éloquence. Elle ne tire pas ses règles d'elle-même, mais elle les cherche dans la ,,nature'', dans les discours ,,logiques'' que l'on trouve chez les grands orateurs, dans les raisonnements logiques des mathématiciens et des philosophes. L'usage est ,,le parent, le maître et l'arbitre de l'art'' [24]). L',,usage'', c'est donc d'abord l'union de la rhétorique et de la logique, que Ramus préconisa déjà en 1546 dans son Discours sur la nécessité d'unir l'étude de la philosophie et celle de l'éloquence [25]).

Cependant, il y a, en même temps, un mouvement en direction inverse: on tire non seulement les *règles* de la logique des discours des grands orateurs, on y trouve aussi *l'illustration de ces règles*.

Ce n'était rien de nouveau; Ramus ne faisait que suivre une tradition de l'humanisme littéraire, il ne prétendit d'ailleurs pas autre chose. Rodolphe Agricola avait exercé la même critique sur l'enseignement scolastique: les dialecticiens considèrent les syllogismes comme un but en soi, tandis que, selon lui, la vraie dialectique est utile aux affaires de la vie commune et aux autres arts [26]). Puis, Mélanchthon l'avait suivi en proclamant l'étroite union de la dialectique et de la rhétorique [27]). Vivès de même était partisan d'un empirisme littéraire, lorsqu'il fit ressortir que les langues existaient avant que leurs formes grammaticales, rhétoriques et dialectiques fussent aperçues: par conséquent, ces arts ne doivent pas transformer la langue, mais, bien au contraire, la suivent et s'adaptent à elle [28]). Et enfin Johannes Sturmius, un péripatéticien humaniste, avait enseigné à Paris la dialectique d'Agricola de 1529 à 1537. Ramus est même d'avis que Rodolphe Agricola fut le premier qui, depuis les beaux temps de la Grèce et de Rome, ait retrouvé cet usage excellent de la faculté logique, afin que la jeunesse en étudiant les poètes et les orateurs, apprenne non seulement à parler correctement, mais encore à juger justement; Jean Sturm introduisit le premier cette méthode de l'école d'Agricola à Paris et Ramus avoue que c'est chez lui qu'il l'avait apprise [29]). Pourtant, quoiqu' Agricola soit loué partout, on ne suit presque nulle part son exemple [30]). Et, c'est sans doute en se souvenant des persécutions qu'il avait subies lorsque, dans son élan enthousiaste, il avait tenté de poursuivre cet enseignement, qu'il ajoute que la rage des sophistes fut si grande dans presque toutes les universités, que c'était inviter des tigres et des léopards que de faire apprendre la logique par l'usage qu'en font les poètes, les orateurs, les historiens, les mathématiciens, les philosophes, dans tous les domaines de la vie humaine [31]).

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[23]) Schol. dial. l. III, c. 12, col. 112.

[24]) Schol. dialect. l. IV, c. 16, coll. 157.

[25]) Oratio de studiis philosophiae et eloquentiae conjungendis, Lutetiae habita anno 1546; dans: Collect. pp. 295—307.

[26]) Hartfelder o. c. p. 219.

[27]) Hartfelder o. c. p. 218—221.

Louis Vivès

Ramus avait encore un autre précurseur, bien qu'il ne semble pas être influencé par lui, à savoir Louis Vivès (1492—1540). Vivès avait, lui aussi, formulé les plaintes des humanistes contre l'enseignement scolastique et ses études à Paris ne l'avaient pas plus satisfait que Ramus. Il avait déjà maintenu le droit de critiquer les opinions des Anciens. Contre la dialectique de l'École il objecta qu'elle résout des difficultés purement hypothétiques, „des cas possibles pour Dieu", mais qui ne se posent jamais dans la réalité [32]). Contre les „calculs" de Suiseth il affirma que ceux-ci ,,ne s'appliquent ni à la science, ni à aucun usage pratique''[33]).

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[28]) J. L. Vives, In pseudodialecticos (1519); J. L. Vivis Opera, in duos distincta tomos. Basileae 1555. T. I, p. 274.

[29]) „Rodolphus Agricola primus omnium post beata Graeciae Italiaeque tempora eximium illum logicae facultatis usum revocavit, ut juventus a poetis et oratoribus disceret non solum pure loqui et ornate dicere, sed de propositis rebus acute cogitare prudenterque judicare. Hos dialecticos tam insignes, tamque amabiles fructus Joannes Sturmius ex Agricolae schola Lutetiam Parisiorum primus attulit, academiamque academiarum principem incredibili tam insperatae utilitatis desiderio inflammavit: tum igitur tanto doctore logicam istam ubertatem primum degustavi". Praef. orat. et phil. (prima) Schol. lib. artes praef. = De conjungenda eloquentia cum philosophia, Collect. p. 93.

[30]) Ibid. p. 94; cf. Schol. dialect. l. IV, c. 16, col. 154.

[31]) Collect. p. 92—93; Schol. lib. praef.

[32]) Opera I, 413; De causis corruptarum artium, l. V (1531).

Vivès fit preuve du même goût de l'utile et du concret que Ramus après lui: Il était d'avis que les exercices de dialectique ne donnent aux étudiants aucune connaissance positive; ils ne les habituent nullement à observer les faits concrets; ils ne développent pas en eux les qualités intellectuelles que requiert la pratique, de sorte que ceux-ci ne savent rien des plantes, des animaux, ni de l'homme. Parmi les livres d'Aristote on ne leur enseigne pas ceux qui portent sur la connaissance utile des animaux, mais ceux, inutiles, querelleurs et obscurs, de la ,,Physique'' et du ,,Ciel''. Selon Vivès, celui qui veut pénétrer dans la vraie nature de ces choses, peut s'informer mieux chez les laboureurs et les artisans que chez les dialecticiens, qui ont construit un monde de mots vides au lieu de la réalité concrète[34]).

L'absence de toute connaissance concrète et pratique est blâmée aussi violemment par Vivès qu'elle le devait être un peu plus tard par Ramus; c'est la même horreur de la métaphysique qui les inspire: ,,si quelqu'un a l'horreur de la nature et une disposition pour les rêves malsains, ils disent qu'il a le génie métaphysique''[35]).

Ramus désire lui aussi une liaison intime entre les choses concrètes et la logique, qui ne doit être qu'un moyen pour la connaissance des choses et non pas un but en soi.

Et, comme Ramus après lui, Vives, par réaction contre les subtilités de l'École, ne montra pas non plus beaucoup de compréhension pour le côté ,,idéal'' de la science de la nature; il critiqua ceux qui ,,discutent des cas que l'on ne voit jamais se passer dans la réalité, qui ne peuvent même pas se présenter dans la nature''[36]).

Ils sont donc tous les deux animés par le goût du concret, qui, s'il est exagéré, peut devenir presque aussi nuisible au développement sain et équilibré des sciences naturelles que les subtilités de l'École, mais qui certainement manquait trop à ce moment. Pour Vivès non plus, la théorie n'a aucune signification sans la connaissance empirique: „L'expérience produit l'art, l'art commande l'expérience. Et comme il y a une certaine force dans la terre capable de produire toutes sortes d'herbes, il y a aussi dans notre âme les semences de tous les arts et disciplines" [37]). L'on voit ici déjà que la théorie est considérée comme une potentialité naturelle qui ne devient actuelle que par le contact indispensable avec la réalité concrète. Pour Vivès comme pour Ramus, les vrais principes de chaque science sont tirés de cette science même, et non pas d'une métaphysique ou d'une logique générale [38]).

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[33]) Ibid. Rodolphe Agricola, en énumérant les inanités de l'Ecole, mentionne parmi les problèmes vides de sens, les ,,calculs'' et les discussions sur le maximum et minimum: ,,...verbosa illa est de maximo et minimo et de calculandi (ut aiunt) ratione iactatio'' (De inventione dialectica libri tres. 1539; Hartfelder o.c. p. 218). La haine des ,,calculationes'' et du nominalisme, parmi les humanistes (Agricola, Vivès, Ramus) se dirigeait contre un mouvement qui se trouvait dans un état de dégénérescence et qui finissait par se perdre dans des subtilités inutiles, mais qui, pourtant, surtout à ses débuts, avait forgé les instruments intellectuels de la mécanique moderne. Évidement les avocats de l'empirisme (cet autre ingrédient de la science moderne), les Vivès, les Ramus et les Bacon, ne pouvaient pas prendre assez de distance pour reconnaître les mérites de spéculations ,,mathématiques'' sans utilité immédiate. Voyez aussi plus bas, VIII E; X A.

[34]) De causis corruptarum artium. l. V; Opp. I, p. 408.

[35]) Opp. I, p. 410.

[36]) Opp. I, p. 413.

La réforme pédagogique

Avec Vives, Sturm, et Mélanchthon, Ramus appartient aux pédagogues du nouveau temps qui introduisirent une nouvelle méthode didactique, qui ne demandait plus qu'on apprenne par cœur des règles abstraites, mais qui voulait déduire p. e. des ouvrages des poètes et orateurs les règles générales de la logique. Ils insistaient sur la pratique, les exemples pris des auteurs classiques. Ils voulaient rendre l'éducation plus facile, plus intéressante et plus concrète en y insérant des exemples empruntés à la pratique de tous les jours. Car, selon l'opinion de Ramus, la méthode *naturelle* est aussi, inévitablement, la méthode la plus facile. Ramus croit que dans les sciences mathématiques, par exemple, les méthodes de la pratique sont les plus „naturelles" et les plus simples et, par conséquent, les plus faciles, de même que la manière de parler des orateurs nous enseigne mieux et d'une façon plus naturelle la bonne logique que ne le fait la logique abstraite qui trouve son but dans la contemplation de soi-même. La méthode et le langage de la logique d'Aristote, dit Ramus, sont trop „mathématiques" et, par conséquent, trop difficiles pour les enfants; il donne très peu d'exemples. Dans ses „Analytiques" il n'emploie pas la langue commune, mais une langue géométrique, qui est répugnante aux enfants et inconnue au peuple, éloignée du sens commun et étrangère à l'usage humain (que la Dialectique veut confirmer) [39]). La réforme de Ramus prétend remédier à ces défauts. C'est pourquoi il pourra dire: „ç'a esté toute mon étude d'oster du chemin des arts libéraux les espines, les caillous ... de faire la voye plaine et droicte, pour parvenir plus aisément non seulement à l'intelligence, mais à la pratique et à l'usage des arts libéraux" [40]). Mais, cette citation le met en évidence, non seulement on change la méthode de l'éducation, on en change aussi le but, qui devient maintenant l'application pratique, l'utilité commune. Les novateurs empruntent leur art à la pratique et ils l'appliquent à la pratique; la pratique est à la fois la *source* et la *fin*.

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[37]) Vives, De tradendis disciplinis, lib. I, Opp. I, p. 439.
[38]) Cf. E. Cassirer, Das Erkenntnisproblem, Berlin 1922, vol. I, p. 135.
[39]) Oration pro phil. discipl.; Collect. p. 352.

Cependant, quoique Agricola ait écrit un livre de mathématiques, et Mélanchthon se soit efforcé de rendre plus général l'enseignement mathématique autant que possible, on ne voit pas qu'il y ait un rapport étroit entre leur zèle pour les mathématiques et leur critique de la logique de l'École. Il est caractéristique pour Ramus, d'autre part, qu'il a transféré ces maximes sur le caractère pratique et utilitaire des arts, du terrain des arts exotériques du trivium à celui des arts ésotériques du quadrivium. À lui revient l'honneur de n'avoir pas hésité à attribuer aux mathématiques un même rôle dans la formation de l'esprit que les autres humanistes accordaient déjà à „l'éloquence". Chez Ramus nous voyons s'accomplir la transition qui conduit de l'humanisme philologique et littéraire aux sciences mathématiques et naturelles de la Renaissance.

Ramus veut réformer l'enseignement tout entier: d'abord les arts exotériques, ensuite les arts ésotériques, et enfin les facultés supérieures, la théologie, le droit et la médecine. Dans toutes ces disciplines la méthode généralement suivie se concentre trop sur les livres et les débats vides sur ces livres; elle doit donc être remplacée par l'instruction pratique, par les exemples. Quant à lui, il avait commencé, conformément à ces principes „naturels", par la réforme de la logique: „L'usage, l'usage, dis-je, de la logique doit entrer dans les écoles de logique; il détruira radicalement tous les sophismes". Que l'on propose à la jeunesse en modèle, non seulement la grammaire et la rhétorique, mais aussi la logique de Virgile, de Cicéron, d'Homère, de Démosthène. Qu'elle soit étudiée oralement et par écrit tous les jours et que ces exercices soient également transférés dans le domaine des mathématiques et de la philosophie [41]).

Cette méthode naturelle n'a été inventée ni par Aristote, ni par Ramus [42]). Les navigateurs, les peintres, les architectes, les agriculteurs, en un mot: tous les artisans, n'apprennent pas leur métier en disputant des préceptes nautiques, architectoniques, agraires, mais ils se familiarisent avec lui, après une courte explication, par l'imitation des travaux qui leur sont présentés; donc, en naviguant, en construisant, en labourant, en général: par l'exercice [43]).

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[40]) Remonstrance; cf. Wadd. p. 344; Schol. math. lib. III, p. 74.

[41]) Scholae in liberales artes, praef. = De conj. phil. cum eloquentia, Collect. 95—96).

[42]) Ibid. p. 96.

Dans ses Scholae Dialecticae Ramus émet le vœu que l'enfant sache la grammaire et qu'il ne cherche pas le fruit des études de grammaire dans des altercations bruyantes sur les règles grammaticales. Qu'il apprenne l'arithmétique et la géométrie en s'exerçant par des exemples utiles, et qu'il ne croie pas qu'aucun art soit inventé afin de déclamer à tue tête sur lui-même, comme si l'on devenait maître-ès-arts en apprenant à discuter avec des cris sur les préceptes sans avoir jamais entendu parler de l'usage qu'on en fait. Même les architectes, les boulangers, les pharmaciens, les poulaillers, les bouchers et les autres artisans de cette ville (de Paris) qui ont eux aussi une surintendance de leur art, auraient honte d'instituer leurs examens de telle manière. Ils apprennent leur art en suivant l'usage et l'expérience de leur patron et, leur temps d'apprentissage fini, et le moment de l'examen de maître arrivé, ils ne sont pas seulement interrogés sur les préceptes, mais on examine aussi ce qu'ils valent dans leur métier en leur faisant exécuter et expliquer des exemples difficiles de leur art. Ils ne sont pas jugés dignes du titre de maître parce qu'ils sont capables de réciter un précepte difficile de l'art par cœur, mais s'ils réussissent à exécuter un chef-d'œuvre de leur art. Si quelqu'un s'appelle cuisinier, boulanger, ou quelqu'autre artisan, et qu'il ne sache pas faire les produits de son art, nous crions qu'il faut l'empêcher de continuer son travail et qu'il est digne des travaux forcés: pour la même raison c'est à tort que nous nous estimons être des philosophes si nous avons appris je ne sais quelles règles sans avoir aucune idée de leur emploi [44]). Ramus est donc d'avis que les arts libéraux sont enseignés selon une méthode qui est moins bonne que celle que l'on suit pour l'apprentissage des arts et des métiers.

Heureusement, il peut constater que les grammairiens et les rhétoriciens, et, déjà dans quelques écoles, les logiciens, répudient la sottise des „disputes'' grammaticales, rhétoriques et logiques [45]). Même pour la médecine et pour la théologie il faut opter, à son avis, pour une éducation qui se base sur l'exercice et non pas sur les disputes [46]).

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[43]) Schol. math. l. III, p. 73; Prooemium reform. Paris. Acad., Collect. p. 486).
[44]) Schol. dialect. 1. III, c. 12, col. 111.
[45]) Prooem. ref. Paris. Acad.; Collect. p. 486.

Pour corroborer cette opinion Ramus sait même citer Aristote qui, de son vivant, n'a pas pratiqué la dialectique par la discussion bruyante de la dialectique, mais par l'analyse et l'explication d'Homère, qu'il exposa à Alexandre, et par la lecture, l'explication ou la réfutation des auteurs excellents. Pour enseigner la philosophie à la jeunesse Aristote prit l'habitude d'unir l'éloquence avec la philosophie; il nous faut suivre son exemple excellent [47]). Ramus cite ailleurs le mot d'Aristote selon lequel l'architecte naît en bâtissant et le musicien en jouant [48]). Pour être musicien, dit Ramus, il ne suffit pas de savoir les règles de la musique; il faut entendre chanter les musiciens et il nous faut chanter nous-mêmes. Pour devenir peintre, il ne suffit pas de lire les livres d'un Apelle, mais il faut connaître son œuvre et l'imiter en peignant [49]).

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[46]) Prooem. p. 486—487.

[47]) Schol. dialect. I. III, c. 12, col. 111—112.

[48]) Prooem.; Collect. p. 486.

[49]) Orat. pro phil. discipl.; Collect. p. 356.

VI

LA PHYSIQUE

A. *Le programme des études physiques.* — La physique fondée sur l'empirie. — Caractère livresque de la physique de Ramus; les commentaires sur les Georgiques. — L'influence de Pline. — La physique et l'„éloquence". — L'opinion de Ramus sur les livres scientifiques d'Aristote. — B. *La classification des sciences du quadrivium.* — Platon, Aristote, Géminus sur la classification des arts. — D'après Ramus l'astronomie et l'optique appartiennent à la physique. — C. *Les „Études sur la physique"*. — Explication du caractère compilatoire de la physique de Ramus. — Ses ouvrages de polémique et ses ouvrages d'exposition. — Les „Physicorum libri octo" d'Aristote. — Critique des notions fondamentales de la „Physique" d'Aristote, la privation, la matière, le vide. — Idées hardies de Ramus en physique.

A. *Le programme des études physiques*

L'enseignement de la physique est également critiqué par Ramus. Le mot „physique" n'a pas encore chez lui la signification limitée que nous lui donnons aujourd'hui, mais couvre à peu près le terrain de toutes les sciences naturelles: „d'abord le ciel, puis les météores, les minéraux, les herbes et les arbres, les poissons, les oiseaux, les bêtes, les hommes, voilà les objets d'une véritable physique, et cette étude demande des esprits libres" [1]). Ailleurs, la physiologie (la vue, l'ouïe, le pouls, la vie, la mort) et la combinaison chimique sont comprises dans la physique [2]).

Étudier la physique signifiait à l'époque l'étude des livres de „Physique" d'Aristote. Mais Ramus désire, quoique d'une façon maladroite, le contact avec les choses naturelles. Il blâme la physique des écoles qui est querelleuse et consiste en disputes et débats, tandis qu'il n'y a ni „usage" des choses, ni expérience [3]).

Il se vante que, tandis qu'Aristote dispute obscurément et sans aucune utilité pour la vie humaine, au sujet de la génération et de la corruption des choses, de l'altération, du mouvement local, de l'accrétion et de la diminution *en général,* lui, Ramus (en suivant et en commentariant le texte des Georgiques de Virgile), a éclairé les mêmes objets à propos d'*espèces* particulières de choses naturelles. Il y a exposé comment les animaux (les vaches, les chevaux, les moutons, les chèvres, les abeilles), les arbres, les végétaux (la vigne, le blé) sont générés, altérés, et mus, il a donc fourni une connaissance nécessaire à la vie humaine [4]).

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[1]) Schol. phys. l. VIII, c. 10; Schol. lib. col. 828.

[2]) Schol. phys. l. III, c. 1, col. 691.

[3]) Prooem. ref. Acad. Paris; Collect. p. 476: „de physicae philosophiae partibus altercatio tantum est, usus rerum nullus, nulla experientiă".

Cela peut signifier que Ramus reconnaît que ce ne sont pas les mots, les disputes, les considérations générales, qui résoudront les questions physiques, mais l'observation, mais l'expérience des choses concrètes et individuelles. Ici il révèle donc une tendance empiriste. Mais cet empirisme porte un caractère compilateur; il est à peine un empirisme rationnel dans le sens de Bacon et encore moins dans celui de Newton. Quand Ramus préfère sur l'histoire naturelle les informations qui se trouvent dans les Georgiques de Virgile et dans l',,Histoire Naturelle'' de Pline (qu'il appelle un ,,divin ouvrage'') [5]) aux ,,Huit livres de Physique'' d'Aristote, on dirait qu'il tombe de Charybde en Scylla. Quelque métaphysique, spéculatif et généralisant que soit l'ouvrage d'Aristote, l'ouvrage de Pline, compilation de renseignements divers sur la nature et la culture, est aussi éloigné de l'esprit de la vraie science que celui du Stagirite [6]).

Mais, chez Ramus, l'humanisme se manifeste en même temps que l'empirisme. En professeur d'éloquence et de logique Ramus n'était certes pas chargé d'enseigner la physique, mais il étend évidemment le principe humaniste de considérer *l'éloquence* (rhétorique) comme point de départ pour les problèmes de *logique*, aux autres arts libéraux aussi [7]), de sorte qu'il emploie également ,,l'éloquence'' pour des digressions *physiques*. Il dit qu'il combine l'enseignement de l'éloquence avec l'explication des passages physiques des poètes et orateurs; les Georgiques de Virgile, les Métamorphoses d'Ovide, le poème de Lucrèce, les Questions Naturelles de Sénèque, et l'ouvrage de Pline, ils sont tous tout à fait ,,physiques'' [8]).

Cependant, ainsi que l'union de la logique à l'éloquence n'implique pas qu'il ne regardait pas la logique comme un art en soi, les digressions „physiques" dans son Commentaire sur les Georgiques ne signifiaient pas non plus qu'il ne reconnût pas la necessité d'une physique fondée sur l'observation immédiate de la nature. Pourtant, conformément à ses inclinations personnelles, sa propre contribution à la physique est livresque. Dans son commentaire du „Songe de Scipion" (1546) il croyait utile d'ajouter au texte de Cicéron les opinions des auteurs les plus savants, et il avait ramassé des passages de Platon, d'Aristote, de Cicéron, de Pline, de quelques poètes et aussi de quelques „hommes de notre religion". Il avait fait cela, d'après ses propres mots, „comme copiste ou sténographe (car c'était là tout mon devoir)" [9]).

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[4]) Préface du Commentaire sur les Georgiques; Phys. praef. tert.; Collect. p. 85. Les Georgiques de Virgilius (70—19), poème didactique sur la vie rurale et l'agriculture, traitent de la culture des plantes herbacées, des arbres (en particulier de la vigne) et de l'élevage du bétail et de l'apiculture.

[5]) Orat. phil. discipl.; Collect. p. 339.

[6]) L'ouvrage de Pline est une simple compilation (assez souvent pas de première main) de faits isolés et qui montre, chez l'auteur, une insuffisance de vues d'ensemble étayées sur des bases scientifiques et un manque d'esprit critique. Pline estimait que se promener à la campagne était du temps perdu, ce qui paraît assez étrange pour un naturaliste. Aussi son oeuvre n'est-il qu'un recueil de passages tirés d'une foule *d'écrits* sur la nature ou d'informations apprises par ouï-dire.

[7]) ,,Itaque si quid etiam eloquentiae gratia profitemur, id ipsum fere artis alicujus praeterea et doctrinae gratia profitemur''. Praef. Georg.; Collect. p. 85.

[8]) Orat. phil. discipl.; Collect. p. 340.

Dans le commentaire des Georgiques son ambition va un peu plus loin; il fait ressortir qu'il y a quelques savants qui se contentent d'interpréter les grands écrivains, mais qu'il y en a aussi qui, comme les Anciens, veulent plutôt être les juges que les interprètes des choses. Ainsi ces derniers temps la gloire des Anciens a peu à peu retrouvé son éclat en mathématiques et surtout en astronomie, et l'on a même commencé non seulement à expliquer, mais aussi à corriger Galien en médecine. La même situation se présente en jurisprudence [10]). Cela veut dire que Ramus ajoute au texte des commentaires choisis avec discernement, mais ce n'est pas un choix fondé sur l'observation ou l'expérimentation personnelle, mais une sélection faite parmi les opinions émises dans la littérature. Une sélection, pourtant, dans laquelle les citations de Pline prévalent. „Plinius ait" est le refrain monotone des „Georgiques" de Ramus. On y trouve en même temps d'assez nombreuses citations prises dans les travaux des grands agronomes romains (Columella, Varro, Cato) et dans ceux d'Aristote, de Dioscoride, de Strabon, de Théophraste, témoignant de sa profonde connaissance de la littérature scientifique de l'Antiquité.

Le contenu de la physique de Ramus est, par conséquent, aussi „empiriste" et compilateur que celui de la physique de Virgile ou de Pline; la méthode par laquelle il a obtenu sa connaissance c'est la lecture des textes d'écrivains spécialisés en „physique". C'est donc une physique d'humaniste par la méthode, une physique d'empiriste par la forme et la matière. Sur ce point il imite le „divin ouvrage de Pline", tant admiré par lui, car celui-ci présente aussi à la fois une physique empiriste et une physique d',,humaniste'', et c'est pourquoi on ne saurait espérer davantage d'un livre de ,,physique'' de Ramus, qui, pourtant, n'a jamais été achevé. L'empirisme scientifique que Ramus professait en théorie, ne devint jamais réalité, parce que, par son goût personnel, il était attaché à l'empirisme littéraire en pratique, même pour les questions scientifiques.

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[9]) „Hujus igitur consultationis partes, tanquam librarius aut notarius (nihil enim amplius meum hic esse duco) conscripsi". Praef. in Somnium Scipionis. Praef. orat. et phil. duodecima; Collect. p. 159.

[10]) Praef. Georg.; Collect. p. 84—85.

La septième année d'étude universitaire était destinée à la Physique, et Ramus l'emploie, ou du moins s'efforce de l'employer, de la façon exposée ci-dessus [11]). Cela va à l'encontre de l'usage, mais dans les huit livres de la Physique d'Aristote il y a, selon Ramus, beaucoup de ,,disputation'' contre les Anciens et presque rien qui ne ressemble à une exposition de la vérité physique. Au lieu de parler du livre ,,du Ciel et du Monde'', qui ne contient que des choses qui n'y ont rien à faire, Ramus traite de l'astronomie; dans le livre ,,de la génération et de la corruption'', il choisit les théorèmes solides, qui y sont peu nombreux, et il omet les questions sans importance; il expose au contraire diligemment les livres des Météores et de l'Âme, et ainsi il enseigne la vraie Physique, fondée sur des arguments mathématiques [12]).

Il y avait deux ans qu'il avait émis à peu près la même opinion sur les livres physiques d'Aristote (de coelo, physicorum libri octo, de generatione et corruptione); spécialement les ,,Physicorum libri octo'' consistent d'après Ramus en des sophismes et il critique vivement les abstractions vides de sens sur l'infinité et l'éternité du monde. Quant à des matières solides concernant la *physique des cieux,* on les trouvera chez Ptolémée et Copernic; pour les *météores* [13]) dans Aristote; pour les métaux, les plantes, les animaux, dans d'autres livres d'Aristote, chez Hippocrate, Platon, Théophraste, Georges Agricola, Mattheolus. Et enfin, la matière de physique la plus certaine et pour sa vérité et pour son utilité se trouve en abondance devant les yeux dans la nature, d'où l'on peut la tirer afin de proposer à la jeunesse une doctrine constante des choses naturelles [14]).

Il est remarquable que Ramus reconnaît que la ,,Physique'' d'Aristote est un livre plutôt logique et métaphysique que vraiment physique, mais que — fidèle à son honnêteté coutumière — il renvoie le lecteur quand même à ces livres-là d'Aristote qui, à son avis, contiennent des données utiles et dignes de foi sur les choses physiques (Historia animalium; Meteora; De anima). Ici encore il donne la preuve de sa prédilection pour les choses concrètes.

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[11]) Collect. p. 340.

[12]) Oratio pro phil.. discipl.; Collect. pp. 339—340.

[13]) Ce terme désignait à l'epoque: la météorologie, les vents, la pluie, la foudre, etc., ainsi que les météores.

[14]) Schol. lib. praef.; Collect. p. 96.

En outre, il est intéressant qu'il cite des auteurs modernes (Copernic, Agricola, Mattheolus) à côté des Anciens. Il a une telle indépendance d'esprit que lui, l'anti-scolastique, continue même parfois la tradition médiévale à l'encontre des philosophes grecs tant vénérés par les humanistes, p. e. quand il rejette la théorie d'Aristote sur le mouvement d'un projectile et accepte la théorie de Philopon sur l',,impetus'' [15]), une théorie qui est conforme à la tradition des nominalistes parisiens qu'il n'aimait pourtant pas particulièrement!

B. *La classification des sciences du quadrivium*

La division du quadrivium en arithmétique, géométrie, astronomie et musique se trouve déjà chez le pythagoricien Archytas de Tarente et chez son ami Platon [16]). Par arithmétique Platon entend la théorie des nombres; le calcul ou la logistique (addition, soustraction, multiplication, division et leur application aux choses concrètes) n'est qu'une préparation aux mathématiques vraies et à la philosophie. Elle ne doit pas être étudiée par les futurs gouvernants de l'État dans un but commercial, mais pour la ,,connaissance''; ils doivent continuer cette étude jusqu'à ce qu'ils soient capables de contempler la nature des nombres au moyen de la seule intellection [17]).

Aristote classe parmi les mathématiques diverses sciences qui ne sont pas purement mathématiques: l'astronomie, l'harmonique (la musique), l'optique, et il les appelle les branches les plus physiques des mathématiques [18]). La mécanique est jointe parfois à ces mathématiques appliquées. Évidemment, il les considère comme appartenant à la physique par leur objet, aux mathématiques par l'application qui en est faite. La ,,physique'' d'Aristote s'occupe de la nature, de l'essence, des choses et porte un caractère spéculatif et ,,métaphysique''. La physique *expérimentale* existait à peine et ce furent précisément les quelques branches de la physique (en sens du moderne) où la méthode expérimentale avait connu déjà quelques succès qui avaient permis l'application des mathématiques. Ces matières appartenaient traditionnellement déjà aux mathématiques et elles étaient cultivées par les mathématiciens de profession. Cette situation se prolongera jusqu'au seizième siècle; l'optique, par exemple, était classée encore à cette époque parmi les mathématiques appliquées plutôt que parmi les branches de la physique.

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[15]) Schol. phys. l. IV, c. 8, col. 729.

[16]) République VII 525 B; 526 C.; 527 C.; 530 D. Dans les ,,Lois'' Platon n'en mentionne que trois, à savoir l'arithmétique, la géométrie et l'astronomie, comme sujets à étudier par des citoyens libres. Lois VII, 817 D-E.

[17]) République VII 525 B, C.

[18]) Aristote, Physic. II, 2, 194 a 7—8.

Aristote résout le problème de la classification de l'astronomie, etc., en comparant le cas de l'astronomie à celui de la géométrie: la géométrie s'occupe de certaines déterminations de la réalité corporelle d'un point de vue différent de celui de la physique, en faisant abstraction de leur appartenance à cette réalité corporelle. De même à l'étude physique des astres se joint une étude mathématique des astres; elle ne gardera de la réalité de ces objets que ce qui doit servir de donnée aux problèmes géométriques résolus par les astronomes. Ceux-ci s'occupent donc en fait des corps réels qui se meuvent dans le ciel, mais se limitent aux relations purement mathématiques qui résultent de leur mouvement. Ainsi l'optique présente un ensemble de relations géométriques suggérées par l'expérience, mais indépendant de celle-ci, et l'harmonique un système similaire de rapports numériques [19]). Mais, comme l'a fait ressortir A. Mansion, quand Aristote ne s'occupe pas de déterminer la place de la physique dans l'organisation systématique du savoir, il considère les sciences intermédiaires entre la physique et les mathématiques simplement comme des sciences appliquées, qui se subordonnent à ces sciences plus abstraites et plus générales: on applique les données d'une branche des mathématiques pures (p. e. la géométrie ou l'arithmétique) à une branche des mathématiques physiques (l'optique mathématique ou l'harmonique mathématique), et celle-ci s'applique à son tour à une partie déterminée de la physique (l'optique physique, l'acoustique) [20]).

En général, dans ses écrits logiques, Aristote tend à relier non seulement les sciences mathématiques appliquées, mais même les mathématiques pures avec la physique [21]).

Géminus a élaboré la classification des mathématiques et il les divise en mathématiques des objets de l'intellection pure (l'arithmétique, la géométrie) et en branches qui traitent des objets sensibles: la mécanique, l'astronomie, l'optique, la géodésie, la canonique (la théorie des intervalles musicaux), et la logistique. Il fait la distinction platonicienne entre la théorie des nombres, laquelle considère les espèces et les propriétés des nombres en soi, et la logistique, qui ne considère les nombres qu'en leurs rapports avec les objets sensibles. De même, il fait la distinction entre la géodésie (arpentage et jaugeage, mesurage de surfaces et solides) et la géométrie pure. L'optique est subdivisée dans l'optique proprement dite (qui explique la manière dont les choses sont vues), la catoptrique (la théorie des miroirs), et la perspective appliquée (scènographie). En mécanique il fait la distinction entre la fabrication des machines de guerre, la fabrication des machines merveilleuses (automates, etc.), la mécanique proprement dite (théorie des centres de gravité, du levier, etc.) et la fabrication des sphères qui imitent les mouvements célestes[22]).

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[19]) Aristote, Physic. II, 2, 193 b 24—194 a 12.

[20]) A. Mansion, Introduction à la physique aristotélicienne. Louvain 1913, 97—99.

[21]) Mansion, o.c. p. 101.

Ramus, qui était bien versé dans la littérature des Anciens, a subi toutes ces influences et, en s'écartant de Platon, il a tiré les conclusions d'un développement qui s'était continué pendant le Moyen Âge.

Ramus désapprouve la division alors courante du quadrivium en arithmétique, géométrie, astronomie et musique. D'après lui, la division de Geminus est meilleure: mathématiques des *intelligibilia* (arithmétique et géométrie) et mathématiques des *sensibilia* (mécanique, astronomie, optique, logistique (c-à-d. le calcul pratique), géodésie). D'après Ramus, Aristote fait la distinction subtile entre les sciences mathématiques et les sciences physiques (dans lesquelles les entités mathématiques sont mêlées à la matière et au mouvement. Phys. II) et, par conséquent, il semble enclin à considérer l'astronomie comme une partie de la *physique*[23]). Mais il demeure incertain sur le caractère des disciplines qui sont d'ordinaire mises au nombre des „mathématiques": l'astronomie, l'optique et la musique, et il les appelle „les plus physiques parmi les sciences mathématiques"[24]). Cependant, Ramus a des objections contre cette classification: ces disciplines appartiennent d'après lui indubitablement à la physique. La déclinaison et la conjugaison de termes de la physique ne se fait pas par la faculté physique mais par la faculté grammaticale; de même on peut considérer les choses physiques en logicien quand on parle des espèces de causalité, et, quand le physicien applique la géométrie et l'arithmétique aux choses physiques, il exerce la faculté mathématique[25]). Ramus veut dire ici que l'astronomie et l'optique, qui ont pour objet des choses concrètes ne cessent pas d'appartenir à la physique parce qu'elles se servent des mathématiques, pas plus qu'elles ne deviennent grammaire lorsqu'elles se servent d'une langue correctement parlée. La musique, dit-il, a pour objet les sons, l'optique la lumière, l'ombre et la densité (du médium), par conséquent des qualités physiques et sensibles. Et enfin, l'astronomie ne fait pas seulement partie de la physique, elle en est même la partie suprême [26]).

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[22]) T. Heath, A History of Greek Mathematics, Oxford 1921, vol. I, pp. 17—18.
[23]) Schol. math. lib. IV, p. 109.
[24]) Schol. phys. lib. II, c. 2; col. 668.
[25]) Ibid.

Ramus s'est occcupé seulement de l'astronomie et de l'optique. Il n'a jamais publié un écrit sur ces sujets, mais dans son Testament (de 1568) il parle des travaux qu'il a commencés avec Frédéric Reisner „spécialement en optique et en astronomie" [27]). L',,Optique" de son élève Reisner était pour une grande part l'œuvre de Ramus, le titre ne permet pas d'en douter [28]), ni la préface de l'éditeur Nicolas Crugius, qui l'attribue aux efforts unis de Ramus et Risner [29]). Dans cette ,,Optique", Ramus et Reisner, malgré la critique d'Aristote émise autre part par Ramus, citent littéralement le Stagirite, qui reporte finalement l'optique dans la réalité physique, lorsqu'il reconnaît qu'elle va à rebours de la géométrie: ,,Car la géométrie considère des lignes physiques, mais non pas en tant qu'elles sont physiques, tandis que l'optique considère des lignes mathématiques non point en tant qu'elles sont mathématiques, mais physiques" [30]). Cette opinion ils la trouvent confirmée par Alhazen et Vitellion. Conformément aux idées sur les relations de la physique et des mathématiques exposées plus haut, Ramus et Reisner disent qu'un rayon n'est pas une ligne mathématique sans latitude, mais quelque chose de physique, de sensible, et l'optique considère une ligne mathématique non pas dans ses propriétés mathématiques, mais dans ses propriétés physiques. Le rayon est donc une „ligne naturelle, sensible et corporelle", au milieu duquel la pensée met une ligne géométrique [31]). L'optique porte donc un caractère mixte, comme l'astronomie, mais elle est essentiellement une part de la physique [32]).

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[26]) Ibid.

[27]) Waddington o.c. p. 326.

[28]) Opticae libri quatuor ex voto Petri Rami novissimo per Fridericum Risnerum ejusdem Mathematicis adjutorem olim conscripti, Cassellis 1606.

[29]) M. J. A. Vollgraff et de même Waddington (o.c. p. 475—476) sont d'avis que la participation de Ramus est également prouvée par deux lettres de Ramus à Théodore Zwinger de Bâle, dans lesquelles il parle de „notre Optique": „Rescribo de editione nostrorum Opticorum" (Sept. 1571; Waddington p. 436); „Scribe ad nos, si noster Fredericus Basileae sit, omninoque quid agat Episcopius de Opticis" (déc. 1571; Waddington p. 436). Mais en septembre 1570 Ramus écrivit à Grynée (le jeune) en lui demandant s'il allait éditer Alhazen et Vitellion avec une préface de Reisner qui devait l'aider (Waddington p. 429). Il nous semble donc que "editio nostrorum opticorum" ne signifie pas „l'édition de notre optique", mais plûtot „l'édition de nos opticiens", à savoir (les oeuvres optiques) d'Alhazen et de Vitellion. C'est en accord parfait avec la question: „que fait Episcopius avec les Optiques", car l'Optique d'Alhazen et l'Optique de Vitellion, éditées par Reisner, parurent à Bâle chez Episcopius en 1572: „Opticae Thesaurus Alhazeni ... Item Vitellonis ... adjectis etiam in Alhazenum commentariis a Frederico Risnero". Dans ces lettres Ramus n'écrit donc pas de sa propre Optique, mais des livres des deux opticiens médiévaux. Cf. J. A. Vollgraff, Risneri Optica cum annotationibus Willebrordi Snellii, Pars prima, librum primum continens. Gandavi 1918, p. 22b—23b.

[30]) Aristote, Physic. II, 2, 194 a 9—12; cf. Mansion o.c. p. 98.

Dans ce traité Ramus continue encore une tradition médiévale; son livre est fondé sur Vitellion, Alhazen et Peckham, qu'il cite souvent. Fidèle à son attitude impartiale, il dit en outre, que la théorie de la lumière et de la vue de Lucrèce, de Démocrite et d'Epicure, (donc de matérialistes notoires), est „claire" [33]).

L'astronomie, l'optique, etc. étant renvoyées au domaine de la physique, Ramus ne reconnaît que *deux* arts mathématiques proprement dits, l'arithmétique et la géométrie [34]), une idée que l'on trouve également chez l'ingénieur italien Niccolo Tartaglia [35]). Cela ne contredit pas l'opinion émise ailleurs, que les mathématiques ne doivent pas être séparées de leur application dans l'astronomie et la musique, puisqu'il ne faut pas séparer un art de son application [36]). La splendeur d'un art est dans l'emploi qu'on en fait, l'astronomie est donc du point de vue méthodologique pour une grande part de la géométrie pratique, mais quant à son objet elle appartient à la physique.

C. *Les „Études sur la Physique"*

Évidemment le résultat du programme de Ramus est que la physique est traitée d'une manière assez livresque, qu'elle est encore en grande partie une „physique de cabinet" qui ne s'appuie guère sur les expériences faites de propos délibéré. Et, bien qu'il n'hésite pas à recommander les ouvrages de Copernic, de Georges Agricola et de Mattioli, sa physique particulière demeure une ,,physique d'humaniste'' en tant que l'explication des livres scientifiques de l'Antiquité y occupe une place prépondérante.

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[31]) J. A. Vollgraff, Risneri Optica, lib. I, c. 3, pp. 17, 19.

[32]) Cf. Oratio de sua professione; Collect. p. 527. Dans l'enseignement traditionnel l'optique était une part de la géométrie; la „physique" se rapprochait plutôt de ce que nous appelons aujourd'hui „philosophie naturelle".

[33]) „luculenter", Risneri Optica, ed. Vollgraff, lib. I, c. 3, p. 13.

[34]) Schol. math. l. IV, pp. 108—109; Schol. phys. lib. II, c. 2; col. 668.

[35]) N. Tartaglia, Euclide Megarense acutissimo philosopho, solo introduttore delle scientie mathematice, Venetia 1569, II, 3. Tartaglia mentionne l'opinion de Pierre d'Ailly, qui était d'avis que la musique, l'astronomie et la perspective ne sont pas de mathématiques pures, mais des sciences intermédiaires entre les mathématiques et les sciences naturelles, ou une combinaison de celles-ci. Tartaglia, o.c. II, 2; cité par E. W. Strong, Procedures and Metaphysics, Berkeley 1936, pp. 66. 260. Comme si souvent, des conceptions nouvelles de la Renaissance on retrouve ici encore, quelques traces au Moyen Âge déjà.

[36]) Voyez plus haut, V B.

D'autre part, ,,où la chèvre est attachée, il faut qu'elle broute''. Vers 1560 la science expérimentale était dans son enfance et les cercles universitaires et humanistes de Paris ne stimulaient pas la recherche scientifique. En outre, l'on ne voit pas comment un homme, qui après 1561 avait à sauver sa vie trois fois par la fuite (pour finir par être assassiné tout de même) aurait pu trouver la tranquillité nécessaire pour des travaux d'observation. Mais peut-être cet argument n'est pas convaincant dans le cas de ces enthousiastes du savoir: Palissy continua ses observations malgré les persécutions jusqu'à son assassinat et William Turner fit ses recherches botaniques et ornithologiques pendant et entre ses exils. Quoiqu'il en soit, considéré dans le cadre historique, il faut plutôt louer Ramus de ce qu'il a fait que le blâmer de ce qu'il n'a pas fait.

En outre, il ne faut pas oublier qu'il n'a jamais écrit une ,,Physique'', car ses ,,Études sur la Physique'' (Scholae physicae) ne doivent pas être regardées comme telle. Ramus a écrit deux séries d'ouvrages sur les sciences: les ,,Scholae'', qui sont des livres de réfutation dirigés contre les diverses disciplines telles qu'elles furent cultivées dans les écoles, et des livres d'exposition. Ainsi, à côté de ses ,,Grammaires'' il y a les ,,Scholae Grammaticae'', où il rassemble toutes les critiques que lui suggérait la lecture de Priscien et des autres grammairiens; à côté de la ,,Rhétorique'' dans laquelle son ami Omer Talon avait rédigé les préceptes de la rhétorique, il y a les ,,Scholae Rhetoricae'', où Ramus combat Cicéron, Quintilien et leurs adhérents, et à côté de la ,,Dialectique'' il y a les ,,Scholae Dialecticae'', des essais de logique dans lesquels il critique la logique d'Aristote.

Par conséquent, les ,,Scholae physicae'' ne sont pas une exposition de la physique de Ramus, mais une réfutation des huit livres de ,,Physique'' d'Aristote. Leur contenu est déterminé par l'ouvrage d'Aristote, qu'il suit pas à pas. Il est donc évident que les ,,Scholae'' ne contiennent pas la physique de Ramus (quelques remarques dispersées mises à part), puisqu'une de ses maximes est qu'il ne faut pas identifier l'étude de la physique à l'étude des livres ,,Physicorum'' d'Aristote. Or, les ,,Physicorum libri octo'' ne sont même pas l'exposition de la physique[37]) d'*Aristote* (que l'on trouve plutôt dans les

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[37]) Le mot pris ici au sens moderne, de „science", non pas de „philosophie".

,,Météores" et les autres livres de physique mentionnés plus haut), car ils traitent surtout du changement des choses (,,mouvement" dans le sens aristotélique). Aristote y expose ses théories, plus métaphysiques que scientifiques, sur les *causes* du changement (causes finales, formelles, matérielles et efficientes). C'est précisément une des plus graves objections de Ramus que la ,,Physique" d'Aristote ne s'occupe pas des choses concrètes de la nature, mais traite des questions logiques et métaphysiques. En outre il met en évidence les contradictions dans ce livre et, autant que possible, il combat les opinions qui lui semblent fausses, en leur opposant des textes empruntés à quelque autre ouvrage d'Aristote ou même à quelque autre chapitre de la ,,Physique" elle-même. Naturellement, l'idée ne lui vient pas qu'il y aurait un développement possible, p.e. dans la direction empiriste, dans la pensée d'Aristote.

Il montre clairement ce qu'il y a de ,,non-fondé dans la nature" dans ce livre et critique quelques-unes de ses notions fondamentales. En accusant Aristote de confusion, d'obscurité, de contradiction et d'erreur, Ramus a souvent raison, mais aussi souvent il dépasse les limites de ce qui est juste et montre qu'il n'a pas compris la vraie pensée du Philosophe.

Sa prédilection pour les choses concrètes se manifeste surtout par le fait qu'il rejette les abstractions sans signification physique, les notions qui ne représentent rien de concret. Aristote admet trois principes des choses: la forme, la matière et la privation. Ramus rejette énergiquement la ,,privation": l'admettre comme principe veut dire que ,,la négation est un principe physique" [38]); la privation ne peut être une *cause*, car une cause est le salut d'une chose, la privation ne peut en être que la ruïne [39]).

Ensuite sa critique se dirige contre la ,,matière première". D'après Aristote elle *n'est* pas en soi, elle n'est que la potentialité d'être. Ramus, au contraire, est d'avis que la matière première est ,,actuelle" [40]): ,,Aristote a posé un double rien en physique, la privation et la matière première; réduisons ces deux riens à rien" [41]) et, en alléguant d'autres passages d'Aristote [42]), il se vante d'avoir réussi à réfuter ces erreurs par Aristote lui-même.

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[38]) Schol. phys. lib: I, c. 7; col. 648.

[39]) Ibid. col. 649.

[40]) ,,Materia est non ens (ait Aristoteles) . . . Materia enim subjectum est formae permanens . . . et materia ens actu dicenda est". Schol. phys. lib. I, c. 9; col. 655.

[41]) ,,Aristoteles duplex nihilum in physica complexus est, alterum privationis. alterum materiae primae, nihilum hoc utrumque nihili faciemus: Aristotelem denique Aristotelis virtutibus et legibus metiemur". Schol. phys. lib. I, c. 9; col. 669.

Ramus pense que, bien que critiquées par Aristote, les idées de Platon sur les principes des choses étaient plus justes [43]). En général Ramus prend la défense des philosophes pré-aristotéliques contre les attaques d'Aristote et il contribue par là à préparer la voie au renouvellement des théories corpusculaires. Aristote critique la doctrine du vide de Démocrite; Ramus, sans accepter la théorie atomique, est d'opinion qu'Aristote l'a mal comprise et il semble incliné lui-même à des conceptions corpusculaires et à l'acceptation du vide dispersé [44]). Il réfute la doctrine aristotélique du mouvement d'un projectile sur laquelle Aristote avait fondé un de ses principaux arguments contre le vide. Ramus rejette aussi tout argument emprunté à la divisibilité infinie de l'espace, car en physique il n'y rien d'infini; ni l'infiniment grand, ni l'infiniment petit, ni l'espace infini, ni le temps infini. Il s'oppose énergiquement à ce qu'on étende des raisonnements valables pour les entités mathématiques intelligibles aux choses physiques sensibles. Le mathématicien utilise des entités divisibles à l'infini, le physicien n'a rien que le fini; il ne s'occupe que des corps sensibles et tangibles qui ne sont que finiment divisibles [45]). Toute la doctrine d'Aristote sur l'infini, le lieu, le vide et le temps est mal fondée [46]) et ne fait pas partie de la physique.

Toutes ces critiques n'impliquent pas que Ramus abandonne le principe fondamental de la philosophie naturelle d'Aristote: la dualité „forme-matière" est maintenue, mais il croit l'interpréter plutôt dans le sens de Platon que dans celui d'Aristote.

Ajoutons que Ramus rejette l'élément du feu [47]) et l'explication du mouvement d'un projectile par moyen de l'air [48]) et qu'il est favorable à l'idée du mouvement de la terre, — et l'on verra que Ramus, sans contribuer positivement à la physique, est plus ouvert à un renouvellement de la théorie que la plupart de ses contemporains et qu'il a préparé une voie dans laquelle il ne s'est pas engagé lui-même.

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[42]) Schol. phys. lib. I, c. 7; col. 649, 651.

[43]) Lib. I, c. 9; col. 655.

[44]) Schol. phys. lib. IV, c. 9; col. 731—732. Sur le problème du vide, voyez C. de Waard, L'expérience barométrique, ses antécédents et ses explications. Thouars 1936.

[45]) Schol. phys. lib. VI, c. 1, col. 761.

[46]) Schol. phys. l. IV, c. 14; col. 738.

[47]) Schol. phys. lib. VIII, c. 4; col. 801.

[48]) Schol. phys. lib. IV, c. 8; col. 729.

VII

LES COLLABORATEURS DE RAMUS

Ramus cherchait des assistants pour les mathématiques. — Jean Péna; Pierre Forcadel; Friedrich Reisner. — Idées hardies de Péna en physique; son influence sur Tycho et sur Kepler.

En sa qualité de maître-ès-arts Ramus s'était chargé de faire un cours sur les six premiers livres d'Euclide en 1544. En tant que professeur royal (dès 1551) il n'avait pas à enseigner les mathématiques et la physique, mais il désirait pourtant approfondir ses connaissances mathématiques. Premièrement, parce qu'il étendait le principe humaniste de l'unité de l'enseignement de l'éloquence et de la logique aux autres arts libéraux; par conséquent, il faisait des digressions mathématiques et physiques quand la lecture des auteurs classiques y donnait lieu. Deuxièmement, parce que son programme d'une réforme de tous les arts libéraux lui imposait la tâche d'écrire des manuels de tous ces arts; par conséquent, il lui fallait avoir un savoir plus profond des auteurs mathématiques de l'Antiquité. Pour accomplir cette tâche il attirait des collaborateurs, et lorsque Charpentier le lui reprocha, il avoua franchement qu'il avait employé comme tels d'abord Jean Péna, un homme érudit en grec et latin, qu'il avait aidé à obtenir la chaire royale de mathématiques, ensuite le jeune allemand Frédéric Reisner, un habile mathématicien, et aussi souvent Arnaud d'Ossat, et qu'il n'y avait nul mathématicien à Paris dont il n'eût cultivé l'amitié et nul artisan mécanicien dont il n'eût examiné et fouillé l'atelier[1]). L'on pourrait ajouter Pierre Forcadel, quoiqu'il n'appartînt pas aux „doctes et érudits en latin et grec", car il ne savait pas assez bien le latin pour l'écrire.

Ramus mentionne ailleurs ses premières études mathématiques sous Oronce Finé, le premier professeur public des mathématiques à Paris. Après cela, la rhétorique et la philosophie l'occupèrent totalement jusqu'à ce que son élève (en philosophie et rhétorique), Jean Péna, l'exonéra de la tâche mathématique qu'il s'était imposée. Il était le meilleur de ses disciples et Ramus était enthousiaste en voyant son habileté à se familiariser avec tous les arts, notamment avec les littératures grecque et latine, la philosophie et les mathématiques [2]). Après la mort d'Oronce, Péna obtint grâce à l'influence de Ramus la chaire royale de mathématiques (1555), mais, au profond regret de son maître, il mourut peu de temps après, en 1558, âgé de 26 ans [3]).

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[1]) „E doctis latineque et graece eruditis, Jo. Paena in primis mathematici studii nobis adjutor fuit: et adjumento nostro in regiam cathedram ascendit. Nobis deinde adjutor mathematici studii fuit adolescens Fredericus Reisnerus Germanus, in mathematicis ita versatus . . .". Actio sec. math. (1566); Collect. p. 592.

Sa connaissance du grec le rendait capable de traduire des œuvres mathématiques du grec en latin; il édita le texte grec avec la traduction latine des „Sphériques" de Théodose (1558) et de l'Optique et Catoptrique d'Euclide (1557).

Au moment de la mort de Péna, Ramus s'occupait de la physique; il lui fallut interrompre ces études et s'engager de nouveau dans les études mathématiques. Il chercha partout de l'assistance et, enfin, Pierre Forcadel vint le rejoindre. Cependant, c'était un homme „sans lettres et sans philosophie", qui avait acquis ses connaissances mathématiques exclusivement par l'usage" (c'est-à-dire qu'il était un autodidacte sans éducation humaniste et académique). Avec lui Ramus reprit ses études d'Euclide et il lut encore les „Sphériques" de Théodose et le livre sur „la Sphère et le Cylindre" d'Archimède et se préparait déjà à la lecture d'Apollonius et de Pappus, lorsque la première guerre civile mit une fin prématurée à cette collaboration qui n'avait durée qu'un an et demi [4]). Les calvinistes (dont il était depuis peu) furent chassés de Paris en juillet 1562 et Ramus s'enfuit dans l'abbaye de Royaumont et, ensuite, à Creil, où il acheva ses „Scholae physicae" (publiées en 1565) [5]). Après la paix d'Amboise (mars 1563) Ramus rentra à Paris et, son influence rétablie, il fit nommer Forcadel lecteur royal.

Conformément à son caractère de non-érudit, Forcadel enseignait les mathématiques en français. Évidemment il savait le latin suffisamment pour traduire des ouvrages scientifiques du latin en français, à savoir les Éléments d'Euclide (1564—'65), les Sphériques de Théodose (1572) et le livre sur les corps flottants d'Archimède (1565). Il écrivit aussi une „Arithmétique" française (1556—'57) et „L'Arithmétique par les gects" (1558) (c-à-d par les jetons), une méthode de calcul à la portée des gens peu lettrés [6]).

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[2]) „Interea tamen Joannem Penam nostrae disciplinae alumnum nactus mathematici oneris fasce me sublevatum et exoneratum putari. Adolescens enim fuit ingenio quidem, ad omnes artes percipiendum mirabili; studiis autem in literis latinis et graecis, in philosophia praecipue et mathematica tanto, ut ardentius aut flagrantius nihil unquam viderim". Math. praef. quarta; Collect. p. 188.

[3]) Ibid. p. 188.

[4]) Oratio de sua profess., Collect. p. 521). „Itaque cum de physicis jam cogitarem saxum idem rursus humeris nostris impositum, animo potius quam robore sustinui. Auxilia undique exquisivi. P. Forcatelus ... sine literatura, sine philosophia, solo ingenio atque usu quodam mathematicus sesquiannum apd nos fuit", Praef. math. quarta; Collect. p. 188.

[5]) À la fin du livre II il dit qu'il médita ce qu'on vient de lire pendant une „tempête terrible" à Royaumont, où il fut libéralement et hospitalièrement recueilli par Barnabé du Failleul, et à la fin du livre VIII il ajoute qu'il médita le contenu des pages précédentes à Creil, où il fut reçu par Bertrand Magdeleine et Jean Lebel, et où il profitait surtout des conversations avec l'érudit Louis Charbonnier.

Ensuite ce fut Reisner qui travailla avec Ramus, jusqu'à ce que la seconde guerre civile interrompit cette collaboration, parce que Ramus dut quitter Paris pour la deuxième fois (1567—'68). Après son retour il retrouva Reisner, qui était resté à Paris et avait pu sauver le manuscrit des „Scholae Mathematicae" [7]). Dans le testament de Ramus, Reisner fut nommé professeur à une chaire de mathématiques („arithmétique, musique, géométrie, optique, mécanique, géographie, astronomie") fondée par ce testament „afin qu'il achève les travaux que nous avons commencés ensemble, spécialement en optique et en astronomie" [8]). Après la mort de Ramus, Henri de Monantheuil, ancien élève de Ramus, réclamait en vain l'exécution du testament [9]). Peu après, Monantheuil fut nommé professeur royal en mathématiques; il s'est montré disciple fidèle de Ramus en éditant et commentariant des livres de mécanique.

Reisner édita des livres d'optique d'Alhazen et de Vitellion. D'autres élèves, Nicolas de Nancel et Arnaud d'Ossat, firent également des traductions latines des anciens mathématiciens sur les instances de Ramus. Ces jeunes gens étaient des élèves devenus collaborateurs, mais pas de précepteurs. Il y avait un échange d'idées et une activité littéraire commune (p. e. la composition de l'Optique de Reisner et Ramus); le profit était des deux côtés.

Ce fut surtout Jean Péna qui émit des idées hardies (dans sa Préface de 1557). En astronomie il supporta indirectement le système de Copernic lorsqu'il dit que, du point de vue de l'optique, de deux choses l'une: ou la terre est au centre de l'univers et le soleil tourne autour d'elle avec ses deux satellites Vénus et Mercure, le centre de l'orbite desquels il occupe (c'est donc le système d'Heraclide de Ponte!), — ou le soleil est en repos au centre de l'univers ainsi qu'au centre des orbites de la terre, de Vénus et de Mercure, qui se meuvent autour de lui (le système de Copernic!). La dernière opinion lui semble très probable, mais il ne se prononce pas décidément en sa faveur. Bien qu'il ne soit pas copernicien, il avait, comme Ramus, Copernic en grande estime [10]).

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[6]) Cf. J. Fontès, Pierre Forcadel. (Suite). Mém. Ac. Sc. Toulouse, 9me série. T. VII (1895). p. 321.

[7]) Resnerus noster (qui Lutetiae permansisset) e praedorum manibus mathematicos commentationes averterat". Praef. math. quarta; Collect. p. 188.

[8]) Waddington o.c. p. 326. Cependant il n'a jamais occupé cette chaire. Cf. Waddington o.c. p. 336.

[9]) Oratio pro mathematicis artibus, Paris 1574.

Péna fait ressortir que la question du mouvement de la terre est si controversée que l'on a des autorités *pour* (le Timée de Platon, Philolaus, Ecphante, Seleucus, Aristarque, Archimède et „en notre temps le très célèbre Copernic" [11]) et *contre* (Aristote, Ptolémée). Pourtant il est d'avis qu'en astronomie il ne faut pas peser les autorités humaines,mais n'estimer que les raisons et les causes. „Afin que, les personnes mises de côté, la chose soit jugée selon ses mérites, je dis, que par la lumière de l'optique la controverse douteuse est résolue assez vite" [12]). En bon disciple de Ramus il ne veut donc recourir qu'à l'observation des astres et, bien qu'il ne se prononce pas définitivement en faveur du mouvement annuel (parce qu'il ne trouve aucune indication décisive par l'observation), il croit qu'il y a quelque mouvement de la terre qui la fait éloigner du centre du monde.

Péna rejette l'opinion de Peckham, qui pensait que la voie lactée est sublunaire: il serait alors nécessaire, selon les principes de l'optique, qu'il y ait de la parallaxe. En outre, il repousse la doctrine alors courante, selon laquelle les comètes sont des exhalations terrestres qui se meuvent dans les régions sublunaires. D'après lui, l'optique démontre la nullité de cette opinion.

C'est une idée révolutionnaire, qui choque les fondements du système d'Aristote. D'après Aristote il y a une différence essentielle entre le monde sublunaire, où règne le changement et où le mouvement naturel est rectiligne, et le monde céleste, qui est perpétuellement le même et où tout mouvement est circulaire. Or, les comètes qui, d'après les anciens astronomes, ne remplissent pas ces conditions, appartiennent par conséquent au monde sublunaire et altérable. Elles appartiennent à la météorologie et non pas à l'astronomie.

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[10]) Cf. Préface de J. Péna sur l'emploi de l'Optique dans la science, dans son édition de l'Optique d'Euclide: Euclidis Optica et Catoptrica, nunquam antehac graece aedita. Eadem latine reddita per Ioannem Penam. Parisiis 1557. Nous empruntons les données sur cette préface au résumé que Kepler en fit au commencement de sa „Dioptrique" (Werke IV, pp. 334—341; Opera, ed. Frisch, II, pp. 519—524) et aux citations que Frisch en a données dans ses notes (Opera Kepleri II, p. 573).

[11]) Cf. Opera Kepleri, ed. Frisch II, p. 573.

[12]) Ibid.

Comme Ramus, Péna rejetait aussi la sphère du feu, ainsi que les sphères célestes: les planètes sont mues par leur propre force.

Une autre hérésie fondamentale: Péna pense même que l'air (un élément terrestre et corruptible, d'après Aristote!) remplit l'espace interplanétaire. Ceci est donc en contradiction complète avec Aristote qui est d'avis que le ciel consiste en un élément spécial et incorruptible, l'éther. Péna ajoute que ni la crédulité du vulgaire ni même le jugement de Vitellion ne pourra le détourner de l'opinion que l'air ne doit pas être distingué de l'éther; opinion dont la justesse est démontrée par l'optique, qui nous apprend que les distances de deux astres à l'horizon et en leur culmination sont égales. Ici encore se révèle son indépendance vis-à-vis de l'autorité et sa confiance dans l'observation directe de la nature. Sans doute, son argument contre l'éther est fondé sur une observation inexacte. S'opposant à Péna, Tycho Brahé et Kepler l'ont réfuté, parce que les instruments perfectionnés de Tycho (beaucoup plus grands et plus précis) démentirent la constance de ces distances [13]). Mais, ce qui nous importe ici, c'est que Péna a fondé son argument sur *l'observation.*

En reconnaissant que les comètes ,,corruptibles" appartiennent au monde céleste, et en plaçant l'air, un élément ,,corruptible", entre les astres, Péna attaqua les principes de la physique aristotélicienne. Il y a des preuves abondantes de son influence immédiate sur ce point. Johannes Praetorius (de Nuremberg) et Christophe Rothmann (l'astronome du landgrave Guillaume IV de Hesse) adhéraient à sa thèse sur l'extension de l'atmosphère [14]). Mais, d'après Tycho, la réfraction atmosphérique prouve le contraire de l'opinion émise par Péna: l'atmosphère ne s'étend pas jusqu'aux astres [15]). Il est, pourtant, d'accord avec Péna quand il rejette les doctrines de la sphère du feu, et des sphères planétaires, et la doctrine aristotélique des comètes. Il n'est pas improbable que l'influence de Péna contribua à la genèse de ces opinions de Tycho.

Kepler, enfin, cita Péna dans ses ouvrages d'optique [16]). Dans sa

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[13]) Kepler, Praefatio in Dioptricen; Werke IV, p. 335.

[14]) Voyez pour Praetorius: Tycho Brahé, Astronomiae instauratae progymnasmata, Pars III; Tychonis Opera omnia, ed. Dreyer, T. III, p. 155. Lettre de Tycho à Th. Hagecius du 3 mai 1588; Opp. VII, p. 121. Lettre à H. Brucaeus, le 23 mars 1589; Opp. VII, p. 172. Pour Rothmann: Astron. instaur. Pars I; Opp. II, p. 79. Lettre à Rothmann du 17 août 1588; Opp. VI, p. 135.

[15]) Tycho, Opera II, 79; III, 154—155.

[16]) J. Kepler, Paralipomena ad Vitellionem. Francofurti 1604, cap. IV n. 6; Opera, ed. Frisch, T. 11, p. 208; Werke, ed. Caspar, Tl. II, p. 121.

J. Kepler, Dioptrice . . . item Examen praefationis Ioannis Penae Galli in Optica

Dioptrique il prit même la Préface de Péna, qui est mentionné séparément dans le titre, comme point de départ. Il en donna l'analyse et y trouva beaucoup à louer et beaucoup à critiquer [17]). Il n'est pas d'accord avec Péna pour rejeter l'éther; d'après lui l'éther existe et commence déjà au-dessus des montagnes [18]). Il regrette que Péna ait laissé timidement de côté le mouvement annuel de la terre, mais qu'il ait introduit un mouvement très lent. Il est d'accord pour rejeter l'idée des sphères pellucides du ciel chères aux physiciens aristotéliciens, de la sphère du feu, et de la position sublunaire de la voie lactée et des comètes. Mais Kepler regrette d'autre part que Péna ait abandonné la théorie vraie de Vitellion, (les rayons de la lumière viennent de l'objet aux yeux) pour l'opinion contraire et fausse d'Aristote et il conclut son analyse par des mots pleins de sagesse: „Que. maintenant, l'amateur de la science considère que l'investigation des choses abstruses n'est pas le privilège d'un seul siècle; que la vérité devient souvent quasi furtivement visible, et, offensée par la négligence des philosophes, elle s'esquive de nouveau [19])."

Euclidis, de usu Optices in philosophia. August. Vindel. 1611; Opera ed. Frisch, T. II, pp. 519—524; Werke, ed. Caspar, Tl. IV, pp. 334—41.

[17]) Opp. Kepleri. ed. Frisch, II, p. 450.

[18]) Cf. Paralipom. c. IV, n. 6, fin.

[19]) Kepler, Praef. Dioptrice; Opp. II, p. 524; Werke IV, p. 341.

VIII

L'INDUCTION

A. *L'épistémologie de Ramus.* — Correspondence de la raison et de la Nature. — B. *Induction et déduction.* — Critique de Waddington. — Le rôle de la déduction. — Différence avec Descartes. — Les sciences de l'homme et les sciences de la Nature. — Le platonisme de Ramus et celui de Kepler. — C. *Les résultats de la méthode inductive de Ramus.* — Attitude à l'égard de la Nature.. — La méthode inductive dans l'enseignement. — L'Arithmétique. — La Géométrie. — Critique des mathématiques pures. — D. *Les deux Socrate.* — Comparaison du Socrate de Xénophon et de celui de Platon. — Le Socrate de Ramus et le Socrate xénophontique. — E. *Kepler et Ramus.* — Les conceptions platoniciennes de Kepler contre l'utilitarisme de Ramus. — Lazare Schoner et Willebrord Snellius.

A. *L'épistémologie de Ramus*

La réforme de Ramus n'implique pas l'introduction de la méthode expérimentale proprement dite. Son premier but n'est même pas l'étude de la Nature. Mais comme sa méthode a été inspirée par la logique, la grammaire et la rhétorique, donc par des disciplines qui se rapportent à l'esprit de l'homme, elle est principalement l'étude des usages *humains*, qui sont des applications, souvent inconscientes, du raisonnement naturel (qui s'identifie à son tour au raisonnement logique, puisque la nature, la raison naturelle, dirige l'usage). Et c'est *l'art* qui découvre la méthode naturelle et la rend de plus en plus subtile, tandis que *l'usage* est la pierre de touche pour essayer ce qui est utile ou inutile [1]) Ceci ne veut pas dire l'expérimentation, mais l'observation, l'expérience naturelle, la pratique des bons orateurs et des bons philosophes.

L'idée centrale du ramisme c'est que la vérité se révèle dans la raison naturelle, dans l'intelligence humaine et, en même temps, dans l'ordre des choses naturelles dans l'univers. Cela signifie que, pourvu qu'on suive sa nature (la puissance naturelle de l'intellect à apercevoir la vérité), il y aura une correspondance précise entre nos conceptions des choses et les choses elles-mêmes.

Cela n'implique pas, cependant, qu'il y ait des idées innées: il faut commencer par l'observation et l'expérience, il faut étudier les créatures. Voilà pourquoi la vraie logique est trouvée dans ses applications, ses concrétisations dans le discours, non seulement des orateurs mais même des hommes illettrés; voilà pourquoi les arts mathématiques prennent leur source dans l'usage de ceux qui s'en servent, des hommes de la pratique[2]). C'est donc toujours le même procédé: d'abord „la nature" (la *raison* naturelle, les *actions* naturelles), ensuite l'art qui systématise les données de l'expérience et nous soutient en dressant des règles faciles, précisément comme l'art grammatical qui ne crée pas la grammaire, mais tire de la langue parlée les règles de la grammaire; et c'est encore selon la même idée que Ramus veut déduire du calcul des marchands les règles de l'arithmétique.

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[1]) „Usus enim conjunctus tanquam lapis Lydius erit ad probandum quid utile fuerit, quid inutile". Orat. init. profess.; Collect. p. 422.

Pourrait-on, par conséquent, soutenir que sa méthode est l'induction? Voilà une question qui n'admet pas une réponse tout à fait nette et sans ambiguïté, mais on ne saurait nier que l'induction joue un rôle fondamental dans la méthode de Ramus, puisque l'expérience occupe la première place parmi les trois formes successives de toute science (la „nature", l'art et l'exercice).

B. *Induction et déduction*

Waddington a dit que Ramus „ignore le véritable usage de l'induction" et que „dans son engouement pour la méthode déductive, il veut qu'on l'emploie en physique aussi bien qu'en géométrie . . ." [3]). Sans doute, pour Ramus, comme pour Aristote, les sciences, quant à leur forme, procèdent du général au particulier[4]), et il serait en effet difficile de nier que *l'entendement* consiste en la réduction du particulier au général. Mais ceci n'exclut pas nécessairement l'induction comme méthode d'acquérir la science: la réduction de la „nature" à un art plus ou moins „déductif" *suit* l'observation. Dans les „Analytiques" d'Aristote, sur lesquelles Ramus se fonde pour une grande part, il y a les deux procédés: la méthode résolutive aussi bien que la méthode compositive. Or, dans une de ses préfaces Ramus affirme qu'*Aristote* nous enseigne que le commencement de tous les arts et de toutes les sciences est dans les sens, l'induction, l'observation, l'expérience, et que de ces principes il faut dériver les règles générales, de sorte que celles-ci ne doivent être approuvées que si elles ont été dérivées de l'observation et de l'usage des exemples[5]).

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[2]) Une étude plus approfondie de l'attitude du ramisme à l'égard des conceptions „réalistes" et „nominalistes" des „universaux" vaudrait la peine d'être entreprise. Voyez plus bas le paragraphe sur Ramus et Bacon. Ramus, qui par sa doctrine de la puissance naturelle de l'intellect semble se rapprocher du réalisme, se rapproche plutôt des nominalistes dans sa théologie. Cf. plus haut IV A.

[3]) Waddington, o.c. p. 355.

[4]) Schol. phys. l. III, cap. 1; col. 689. Wadd. p. 346.

[5]) Praef. orat. et phil. (nona) in Agrarias; Collect. p. 143.

Tout paradoxal qu'il semble à première vue, Ramus a, croyons-nous, malgré sa prédilection pour Platon et ses répréhensions sévères d'Aristote, du point de vue épistémologique, plus d'affinité avec le Stagirite.

Ailleurs il dit expressément que les principes de la grammaire, de la rhétorique, de la logique, de l'arithmétique, et de la géométrie sont l'expérience et l'observation qui sont réduites en doctrines générales par la logique [6]), et il s'indigne parce qu'en astronomie on ne s'est pas contenté de ce fondement, mais on y a cherché une cause en inventant des hypothèses allant à l'encontre de toutes les lois logiques pour construire un art [7]).

Ramus met en contraste, (et il faut souligner ce fait), *la vérité des observations* des navigateurs et *l'erreur du raisonnement* de tous les philosophes de l'Antiquité: la vérité est donc dans les choses concrètes et, pour lui aussi, elle est plus ancienne que les opinions que nous en avons! Il est évident que Ramus montre une tendance nette vers l'induction et l'empirisme [8]).

D'autre part, la déduction appartient à toute science, aux sciences „inductives" y comprises. Même les sciences naturelles du temps moderne ont une tendance à l'„explication"; quelques-unes d'entre elles cherchent à dresser un système afin de déduire les phénomènes à partir de principes généraux, d'entités „générales" (éléments, atomes, électrons, etc.), à l'aide des lois physiques et chimiques „générales". Nous avons réuni, comme Ramus le désire, les données de l'induction en un système et en des règles générales, qui nous mettent en état de les en déduire à rebours. Mais personne n'accusera pour autant la science moderne d'un engouement pour la méthode déductive.

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[6]) „Grammaticae ... geometriae, atque omnino praeter astrologiam, cujusvis disciplinae principia sunt experientiae et observationes primae in generalia et universalia documenta a logicis artificibus collectae et inductae". Schol. math. l. III, p. 47.

[7]) „... Hypotheses contra logicas omnes construendae artis leges, sont inventae". Ibid. p. 47.

[8]) Afin de montrer l'autre aspect de la philosophie de Ramus qui le ferait prendre aisément pour un rationaliste, nous citons: „Nulle autorité est au-dessus de la raison; c'est elle, au contraire, qui est la reine et la maîtresse de l'autorité". (Schol. math. l. III). C'est donc la raison qui fonde l'autorité.

„La beste ne conçoit point l'universel, et combien qu' Épicure, abestissant l'homme, ayt voulu attribuer le souverain jugement de toutes choses aux sens, et le déroger à l'entendement, ... jà d'autant qu'il cognoist l'universel, d'autant est-il plus excellent et honorable que le sens, et comprend plus la cause et principe, et est plus scientifique, comme peult estre entendu par Aristote au premier de la Démonstration" (Dialectique (1555), p. 73 et suiv.; v. Waddington, o.c. p. 371.

„L'homme a en soy naturellement la puissance de cognoistre toutes choses: et quand il aura devant ses yeux l'art d'inventer par ces genres universelz, comme quelque mirouër, luy représentant les images universelles et généralles de toutes choses, il luy sera beaucoup plus facile par icelles recognoistre les espèces singulières, et par conséquence inventer ce qu'il cherchera". Mais, d'autre part, il ajoute: „Mais il faut par plusieurs exemples, par grand exercice, par long usage forbir et pollir ce mirouër, avant qu'il puisse reluire ny rendre ces images" (Dialectique, p. 69; v. Waddington, p. 370).

En outre, la critique de Waddington semble être mal fondée, parce que la lecture du contexte (des „Scholae physicae") met en évidence qu'il s'agit ici précisément d'une *défense* de l'induction. Ramus reconnaît qu'il faut procéder des généralités aux choses spéciales, et que les généralités sont nécessaires [9]). Mais, les généralités dont il est question à présent sont le lieu, le temps et l'infini et Ramus nie qu'il soit nécessaire de commencer la recherche physique par la discussion de ces notions. Il les renvoie expressément aux études de la logique et des mathématiques (cela veut dire ici: de la philosophie dans le sens moderne du terme). C'est pourquoi il ne veut pas qu'on commence l'étude de la nature par les „Physicorum libri octo " d'Aristote, qu'il préfère ses „Météores" et son „Histoire des Animaux", qui traitent des choses concrètes et qu'il conseille de leur accorder une place dans l'enseignement physique à côté de livres si éminemment pratiques que ceux du minéralogiste Agricola et du botaniste Mattioli. Pourtant, il termine son livre par le conseil de chercher la physique surtout dans l'observation directe de la nature, du ciel, des météores, des minéraux, des végétaux, des animaux et de l'homme: „voilà les objets d'une véritable physique" [10]).

Par conséquent, il est étrange que Waddington cite précisément cet épilogue des Scholae physicae pour comparer Ramus à Descartes et pour l'accuser d'avoir ignoré le véritable usage de l'induction et d'avoir eu un engouement pour la méthode déductive: „il veut qu'on l'emploie en physique aussi bien qu'en géométrie, prescrivant l'ordre que suivra plus tard Descartes dans ses Principes de philosophie: „Étudier d'abord le ciel, puis les météores . . ." [11]).

Or. cette étude préconisée par Ramus ne prétend pas du tout être déductive et elle ne prétend pas non plus résoudre rationellement tous les problèmes, car Ramus est d'avis qu'il y a des questions insolubles, que les aristotéliciens prétendent pourtant résoudre par des solutions absurdes et sophistiques [12]). Et, précisément parce que cette étude est *inductive* et, par conséquent, requiert du temps et non seulement du génie, il ajoute à la recommandation qu'il fait de cette étude de la

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[9]) Schol. phys. lib. III, c. 1, init; col. 689.

[10]) „Earum rerum physica ingenua est in primis et nobilis". Schol. phys. lib. VIII, c. 10; col. 827.

[11]) Waddington, o.c. p. 355.

[12]) Schol. phys. lib. VIII, c. 1, col. 787.

,,physique vraie et solide'', qu'elle est si vaste qu'elle eût rempli la vie de dix Aristote, quand même ils s'y seraient dévoués tout entiers'' [13]).

C'est toute autre chose que la science déductive de Descartes, qui dit dans son ,,Discours de la méthode'': ,,J'ay tasché de trouver en general les Principes ou Premieres causes, de tout ce qui est, ou qui peut estre, dans le monde, sans rien considerer, pour cet effect, que Dieu seul, qui l'a creé, ny les tirer d'ailleurs que de certaines semences de Veritez qui sont naturellement en nos ames. Après cela, i'ay examiné quels estoient les premiers et plus ordinaires effets qu'on pouvoit deduire de ces causes: et il me semble que, par la, i'ay trouvé des Cieux, des Astres, une Terre et mesme, sur la terre, de l'Eau, de l'Air, de Feu, des Mineraux . . .'' [14]).

L'on pourrait objecter que contrairement à Ramus, Descartes a construit un système de ,,physique'' et que, par conséquent, une comparaison est impossible. Mais il est évident que Ramus s'est bien rendu compte de la différence qu'il y a entre les disciplines du trivium avec (peut-être) l'arithmétique et la géométrie d'une part, et, de l'autre, les disciplines physiques (l'astronomie, l'optique, la physiologie) dans lesquelles on est confronté non seulement avec l'esprit, et la nature humaine, mais aussi avec une ,,nature'' qui est en dehors de l'intellect humain. Il est regrettable qu'il ne nous ait laissé aucun ouvrage d'exposition d'ensemble dans ce domaine et que, par conséquent, nous soyons obligés de ramasser ça et là ses idées et ses doctrines. Cependant, notre essai met en évidence que la conformité de la nature (de l'esprit humain) et de la vraie méthode en dialectique, grammaire et mathématiques est d'un autre caractère que la conformité de la Nature (l'univers) avec notre ,,physique''. Dans les disciplines qui sont des produits de l'intellect humain ou de l'activité inspirée par cet intellect c'est l'usage humain qui est l'objet ,,concret'' de l'étude faite par l'intellect humain. Dans la physique, l'astronomie et la physiologie, au contraire, ce sont les objets créés hors de notre esprit qui sont l'objet de l'étude à entreprendre par l'esprit. Il y a de l'analogie en tant que les deux départements doivent *se conformer:* l'un à l'expérience des phénomènes de l'activité de l'esprit humain, l'autre à l'expérience des phénomènes de la nature hors de l'homme.

Dans ce dernier cas la situation se complique parce que d'un côté on reconnaissait que notre faible entendement doit se conformer aux œuvres de la création, quelque incompréhensibles qu'elles soient; d'autre part le platonisme (qui exerçait une grande influence sur Ramus, bien que d'une autre façon que sur Kepler) poussait vers la conception d'une harmonie entre l'univers et les idées que nous nous en faisons. Sa conception de l'hypothèse astronomique, cependant, nous permet de voir où tombe l'accent. Tous les deux, Ramus et Kepler, croient que l'esprit humain est susceptible de „comprendre" la Nature, mais Ramus veut commencer par la description empirique et mathématique, tandis que Kepler s'efforce d'accorder une partie aussi importante que possible à la pensée *a priori* [15]). Descartes croyait déduire un monde apriori à partir des idées innées; Kepler construisit en esprit des systèmes planétaires différents, mais c'est à la confrontation avec les phénomènes qu'il laissait décider la question de savoir lequel d'entre eux était vrai; Ramus réservait la première place expressément à l'observation, mais il jugeait l'esprit capable de la rationaliser a posteriori dans le cadre d'un système correspondant fidèlement à la réalité.

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[13]) Schol. phys. lib. VIII, c. 10; col. 828.
[14]) Oeuvres de Descartes, éd. Adam et Tannéry, T. VI, p. 64.

En vain attendrait-on de la part de Ramus une analyse de ce problème, ce qui n'implique pourtant pas qu'il ne l'ait pas connu. Ni d'ailleurs, d'autre part, qu'il aurait été capable de construire une „physique" conforme à ses propres principes méthodiques.

C. *Les résultats de la méthode inductive de Ramus*

Ramus insiste sur la méthode inductive, mais cela ne signifie pas qu'il se soit enthousiasmé pour la nature. Il traite toutes ces disciplines en pédagogue et en logicien, tout au plus en mathématicien, non en naturaliste. On ne trouve chez lui aucune trace de l'amour naïf des fleurs, des animaux et des arbres qui nous frappe tellement chez Palissy. Ramus avait promis de traiter toutes les sciences „à la socratique" et cela signifiait pour lui qu'il voulait les traiter d'après sa nouvelle logique et en rapport avec leur utilité pour la vie humaine [16]).

Or, Socrate est le dernier à inspirer l'étude de la nature; ce qui l'intéresse c'est l'homme. Lorsqu'on lui dit qu'évidemment il ne quittait jamais la ville, puisqu'il ne connaissait pas les environs immédiats, il répondit qu'il était bien désireux d'apprendre, mais ce n'étaient point les scènes de la nature et les arbres, mais plutôt les hommes dans la ville qui l'instruisaient [17]). Peut-être ces paroles sont-elles prononcées avec ironie, mais ailleurs il se défend contre l'accusation de scruter témérairement les choses qui sont sous la terre comme celles qui sont dans le ciel et de n'admettre pas non plus l'action des dieux dans la nature, en faisant ressortir qu'il n'entend rien à ces matières, que ce sont là des choses auxquelles il est complètement étranger, et il fait appel au témoignage des Athéniens, qui peuvent déclarer qu'il n'a jamais discuté là-dessus [18]).

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[15]) Voyez plus bas VIII E.

[16]) „Socratis sapientia ... notissima est ... artium liberalium fines ad humanae vitae fructum referre, ut homines his artibus instructis prudentius de rebus agendis deliberarent". Schol. math. l. III, p. 73.

Certes, Ramus n'est le serviteur de personne, même pas de Socrate et on ne trouvera rien de pareil chez lui. Mais, d'autre part, on ne voit pas non plus qu'il ait fait des recherches personnelles dans la Nature, sauf celles de la nature de l'homme. Et, bien que l'encouragement de l'étude de la nature ne manque pas dans ses écrits, il n'occupe pas beaucoup de place dans ses admonitions.

Si l'on tient compte du caractère spécial de l'induction raméenne, on peut conclure que Ramus est un partisan de la méthode inductive dans la *recherche scientifique*. L'on pourrait à peine attendre une autre attitude de la part d'un défenseur si ardent de la méthode inductive dans *l'enseignement*.

D'après le ramiste Lazarus Schoner, quand il s'agit du dilemme de savoir s'il vaut mieux démontrer une proposition par une cause ou par l'induction des exemples (c-à-d. déductivement ou inductivement), Euclide préfère la cause, mais Ramus choisit l'induction des exemples dans l'enseignement de la jeunesse [19]). Et Schoner fait ressortir que bien que la cause soit la source de la science et l'effet le ruisseau provenant de cette source, la source universelle est (immédiatement) superflue pour celui dont la soif peut être étanchée par le ruisseau, et qu'aucun argument n'instruit plus facilement les élèves que l'induction, les effets, les exemples. C'est pourquoi Ramus démontre toute l'arithmétique en ayant recours à l'induction [20]).

Or, il va de soi que si Ramus fait de la méthode inductive et de l'exemple concret la pierre angulaire de sa didactique, la conséquence inévitable en est un certain empirisme dans la présentation des sciences pour les savants aussi.

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[17]) „Socrate: Pardonne-moi, excellent homme! J'aime à apprendre, vois-tu. Or, les champs et les arbres ne consentent à rien m'enseigner, tandis que c'est ce que font les hommes qui sont dans la ville" (Platon, Phèdre 230 d). Nous citons Platon d'après: Platon, Oeuvres complètes, traduction de L. Robin, Bibl. de la Pléiade. 2 vols, Paris 1950.

[18]) Platon, Apologie de Socrate 18 B-C; 19 B-D.

[19]) P. Rami Arithmeticae libri II et Geometriae libri XXVII, a Lazaro Schonero recogniti et aucti. Francofurti 1627. La préface du petit-fils du célèbre Johann Schoner de Nuremberg est de 1599.

[20]) P. Rami, Arithmeticae etc. préface de L. Schoner, p. 4.

Évidemment, cela ne prouve rien quant au *résultat positif* de cette méthode inductive. Il n'apparaît pas que la logique de Ramus, qui est le fruit le plus important de sa réforme, et dont il fait tant de cas, l'emporte sur celle d'Aristote. — Conforme à son principe qu'il faut commencer par l'usage, son „Arithmétique" présente des méthodes qu'il a empruntées, d'après son propre témoignage, aux livres populaires, écrits pour les marchands. Or, ces méthodes ne sont pas toujours les plus directes et l'„Arithmétique" est un ouvrage assez insignifiant [21]). Ici son „induction" a pour résultat un livre sans aucune valeur scientifique.

Il ne réussit pas à composer une *géométrie* inductive et, par conséquent, en ce cas-ci, il lui faillait renoncer à sa méthode inductive et présenter à contre-coeur son sujet d'après Euclide, déductivement, ajoutant pourtant à chaque thèse des exemples empruntés à la pratique, ce qu'Euclide n'avait pas fait [22]).

Il critique les Éléments d'Euclide parce qu'Euclide fait précéder l'arithmétique par la géométrie, qu'il donne des définitions avant qu'on en ait besoin, que les livres arithmétiques sont sans aucun usage pratique et par conséquent superflus. Ramus est d'avis que la théorie des nombres n'a aucune utilité et il rejette le dixième livre comme étant le plus inutile, le plus plein de préceptes et de théorèmes: „c'est une croix sur laquelle les esprits nobles sont crucifiés" [23]). En outre, il y voit l'influence des superstitions pythagoriciennes, c-à-d. des spéculations mystiques des „métamathématiciens" qui trouvaient peu de grâce devant son esprit sobre. Cette critique démontre combien tout ce qui ne trouve pas d'application dans la vie commune, tout ce qui n'est pas „utile" lui paraît seulement une vexation de l'esprit!

D'après Ramus la vraie splendeur de la géométrie ne luit pas dans les préceptes et les théorèmes, mais dans l'emploi qu'en font les peintres, les mécaniciens, etc.; sa fin ultime et suprême est de „bien mesurer" et, par conséquent, les éléments de la géométrie ne sont posés ou enseignés que dans ce but [24]).

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[21]) Cf. M. Cantor, Vorlesungen über Geschichte der Mathematik, 3 Aufl., Leipzig 1907, T. II, p. 565: „Theoretische Feinheiten richtig zu würdigen war seine Sache nicht, und strengen, nach seiner Meinung ganz unnötigen Beweisführungen der Geometrie zog er gewöhnliches Rechnen vor, wie es von den Kaufleuten zu erlernen war", et p. 614: „Bei den Gesprächen mit Kaufleuten . . . lernte er mancherlei unbedeutende Rechenvorteile, welche er schildert". Dans une publication antérieure Cantor caractérisa l'Arithmétique comme „nur die einfachste Anleitung zur Ausführung von Rechnungsoperationen, ohne Verdienst". Z. f. math. u. Physik 2 (1857), p. 357.

[22]) Laz. Schoner, o. c. p. 4.

[23]) Schol. math.

D. *Les deux Socrate*

Les savants ne sont pas d'accord pour décider lequel des deux Socrate, celui de Xénophon ou celui de Platon, est le vrai [25]). Quoiqu'il en soit, l'influence du Socrate xénophontique nous paraît évidente dans ces expositions de Ramus. La lecture de Xénophon décida Ramus à „socratiser" lui-même et ce qu'il avance comme les idées de Socrate a été emprunté sans doute à Xénophon et non pas à Platon; le Socrate de Platon représente pour lui, nous semble-t-il, les opinions de Platon lui-même.

D'après Xénophon, Socrate était d'avis qu'il fallait apprendre la géométrie jusqu' à ce qu'on fût capable de mesurer un champ, afin de l'acheter, de le diviser ou d'en indiquer la répartition du travail, et que cette connaissance était très facile à acquérir. Mais il désapprouvait qu'on s'occupât des problèmes géométriques les plus difficiles, parce qu'il n'en reconnaissait pas l'utilité. De même, il encourageait ses élèves à s'occuper de l'astronomie, mais seulement afin qu'ils pussent en faire usage en navigation, en voyage et en toutes occupations qui demandent la connaissance des jours et des saisons. Il leur déconseillait, par contre, de pousser ces études jusqu'à la connaissance de la course des planètes, leurs distances de la terre, leur vitesse et leurs causes, parce qu'il jugeait que ces études étaient inutiles et prenaient trop de temps. Il louait aussi l'étude de l'arithmétique, mais en ce cas recommandait également que l'on s'abstienne d'activités vaines, tandis qu'il donnait lui-même l'exemple en scrutant toutes choses en tant que cela pouvait être „utile" [26]).

D'autre part, le Socrate de Platon fait ressortir que les géomètres ne s'occupent pas, en réalité, des figures qu'ils dessinent, mais des figures idéales et parfaites dont celles-ci sont des images, du carré absolu, etc., que l'on ne voit que par les yeux de l'esprit [27]). D'après le Socrate platonique le langage de ceux qui manient la géométrie „est tout à fait risible et sent la servilité; car, tenant un langage qui est celui des gens qui pratiquent une action et dont la pratique est le but", ils parlent de *construire* des figures; ils confondent les nécessités de la géométrie avec celles de la vie commune, tandis que le véritable but de la science est la „connaissance" [28]), non pas des choses périssables, mais „de ce qui toujours existe".

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[24]) Ramus, Geometriae libri XXVII, lib. I, p. 1.

[25]) Voyez: L. Robin, Les „Mémorables" de Xénophon et notre connaissance de la philosophie de Socrate. L'Année philosophique *21* (1910), pp. 1—47. Robin prend position lui-même contre l'authenticité du Socrate xénophontique.

[26]) Xénophon, Memorabilia l. IV, c. 7.

[27]) Platon, République VI, 510 D-E.

Et également en opposition diamétrale avec le Socrate xénophontique, le Socrate platonique dit que le vrai astronome ne s'occupe pas de ce qui concerne saisons, mois, années pour le besoin de l'agriculture et de la navigation, car il n'a pas peur que la foule ne juge qu'il prescrit des objets d'étude qui ne servent à rien [29]). La vraie connaissance astronomique n'est point acquise „en contemplant du haut d'un toit, la tête en l'air, le décor de constellations dont le ciel est orné", car cela n'est que la vision du corps au lieu de l'intellection [30]). La vraie astronomie ne considère pas ce décor, dont s'orne la voûte céleste et visible, mais elle étudie „la vitesse réelle" et les vraies figures, „choses qui sûrement sont saisissables par une pensée réfléchie, mais sûrement ne le sont pas par la vue" [31]). „La décoration céleste doit être utilisée pour y prendre des exemples, en vue de l'instruction" de la philosophie [32]). Mais un astronome qui est réellement astronome jugera absurde celui qui estime que le rapport du jour à la nuit ou du mois à l'année ou quelque autre chose de matériel et visible puisse être sans aberration et qu'il est aussi absurde de faire tous ces efforts à les déterminer exactement [33]). Le Socrate de Platon, tout pareillement en astronomie comme en géométrie, se détourne du monde des phénomènes visibles: „quant à ce dont le ciel est le théâtre, nous nous en désintéresserons si nous voulons, participant à l'astronomie de façon réelle, rendre utile, d'inutile qu'il était, ce qui dans notre âme est pensant" [34]).

Sur ce qui constitue l'„utilité" véritable il avance une conception diamétralement opposée à celle du Socrate de Xénophon. Le Socrate de Platon n'encourage point l'étude des sciences appliquées, sauf pour les choses de guerre; la géométrie pratique et la logistique sont jugées très utiles à un général, mais il suffirait pour obtenir des résultats militaires „d'une initiation restreinte à la géométrie et aux calculs" [35]). Du reste elles ne servent que d'introduction aux sciences pures (la géométrie théorique et la théorie des nombres), les seules qui soient dignes d'un philosophe. Pour lui les mathématiques commencent donc à devenir dignes d'intérêt au moment même où le Socrate de Xénophon recommande d'abandonner une étude plus approfondie.

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[28]) Platon, République VII, 527 A-B.
[29]) Platon, La République VII, 527 C.
[30]) Ibid. 529 C.
[31]) Ibid. 529 D.
[32]) Ibid. 529 D.
[33]) Ibid. 530 B.
[34]) République VII, 530 C.
[35]) Ibid. 526 D.

Non seulement le Socrate platonique méprise en général les sciences appliquées, mais il va jusqu'à dénier le rang de science véritable aux sciences de l'observation et de l'expérimentation. L'astronomie et la musique sont deux sciences „sœurs en quelque sorte, l'une de l'autre, ainsi que le disent les Pythagoriciens" [36]), mais, malheureusement, comme l'une a fixé le *regard* sur les choses *visibles*, l'autre a fixé les *oreilles* sur les mouvements harmoniques *perceptibles à l'oreille*, sans aboutir aux choses purement intelligibles: „En s'occupant en effet à mesurer les uns par les autres des consonances et des sons, cette fois sensibles à l'ouïe, on fait, comme c'est le cas des astronomes, un travail qui n'aboutit pas" [37]). Et il se moque de „ces excellentes gens qui donnent aux cordes mille tracas, qui les mettent à la torture en les tordant au moyen des clefs" [38]). Platon critique ces Pythagoriciens qui donnent des noms distincts à „certaines concrétions de sons, tendant l'oreille comme s'ils étaient à l'affût de ce qui se dit chez les voisins", et il blâme aussi que pour trancher une question on s'en remet à l'observation au lieu d'avoir recours au raisonnement [39]).

En outre, tandis que Socrate dissuadait d'examiner comment dieu cause les mouvements du ciel, puisqu'il devait déplaire aux dieux si l'on voulait découvrir ce qu'ils n'ont pas voulu révéler [40]), Platon rejetait cette opinion catégoriquement en disant que le contraire est vrai [41]).

Par conséquent, le Socrate xénophontique encourageait les études pratiques, simples, et utiles en mathématiques et en astronomie, et rejetait les études purement théoriques. Le Socrate platonique, par contre, veut que les fonctionnaires de l'État, (qui sont des philosophes), s'occupent de la science pure, sans se soucier des applications pratiques (la tactique exceptée). Il veut qu'ils s'orientent „vers la science du calcul . . . non dans un esprit vulgaire, mais jusqu'à ce qu'ils soient parvenus, au moyen de la seule intellection, à contempler la nature des nombres; ne pratiquant pas cette science comme font trafiquants et marchands de détail, en vue d'acheter et de vendre, mais tant pour faire la guerre que pour donner à l'âme même de l'aisance à se détourner de la génération et à s'orienter vers le vrai, vers le réel" [42]), c'est à dire qu'il veut qu'ils se détournent du monde des phénomènes visibles et transitoires et s'orientent vers le monde éternel des Idées.

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[36]) République VII, 530 D.

[37]) République VII, 531 A.

[38]) Ibid. 531 B.

[39]) „Les uns prétendent discerner encore par l'ouïe une différence, moyenne entre deux tons, et qui est le plus petit intervalle dont il faille se servir pour mesurer: les autres le contestent et prétendent qu'il est pareil aux sons antérieurement émis· les uns comme les autres donnant aux oreilles la prééminence sur l'intellect!" République VII, 531 A.

[40]) Xénophon, Memorabilia IV, c. 7.

[41]) Platon, Lois VII, 820—821 A.

À l'encontre du ton dédaigneux dont Platon use quand il parle des marchands, le Socrate de Xénophon (quoiqu'il sache bien que les Grecs libres ont abandonné les métiers aux esclaves), fait ressortir que les travaux manuels sont partaitement honnêtes, puisqu'ils sont utiles [43]).

L'humaniste se référant aux Anciens, n'y trouvait que rarement une grande appréciation des artisans et de l'application des mathématiques aux métiers. Aussi l'humanisme littéraire comme tel n'exerçait pas d'influence favorable sur les sciences appliquées. Si l'on trouve de l'intérêt pour la science pratique chez un humaniste, il faut en chercher en général la source ailleurs. Cependant, on peut s'attendre à ce qu'il s'efforce d'affaiblir la signification des textes classiques peu élogieux ou d'alléguer des textes en sens opposé. Les deux procédés sont employés par Ramus, qui a trouvé sans doute un appui considérable dans le Socrate de Xénophon pour son utilitarisme et pour sa conception assez triviale de la fin des études mathématiques, tandis que Kepler (sans le suivre servilement) montre plus d'affinité avec le Socrate de Platon, qui vise la connaissance de la réalité du monde de l'Idée mathématique et astronomique.

E. *Kepler et Ramus*

On comprend aisément l'indignation du grand réformateur de l'astronomie, Johannes Kepler (1571—1630), lorsqu'il lut les passages cités ci-dessus de l',,usuaire". Kepler, pour qui la beauté du monde visible et la splendeur du royaume de l'esprit, des mathématiques, témoignaient également de la majesté du Créateur, ne s'informait pas d'abord après l'utilité pratique, mais il tenait pour une justification suffisante la ,,joie en Dieu" éveillée par ces choses ,,inutiles".

L'aversion de Ramus pour les spéculations métaphysiques et ,,pythagoriciennes" d'Euclide et de Proclus n'est point partagée par Kepler. Les spéculations montrent, dit Kepler, le monde comme dans un miroir; Ramus n'y a rien compris, il ,,agit comme patron de l'ignorance".

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[42]) Platon, République VII, 525 C.
[43]) Xénophon, Memorabilia, l. II, c. 7.

Lazare Schoner avait suivi Ramus pour rejeter avec lui les propositions euclidiennes sur les cinq corps réguliers [44]), comme inutiles, mais après avoir lu le „Mysterium Cosmographicum" (le livre dans lequel Kepler démontre que ces corps ont fourni le modèle d'après lequel le monde a été créé), il est revenu de cette erreur [45]). Ce n'est pas sans un sentiment de triomphe que Kepler constate que son livre a converti ainsi un des disciples de l'„Euclideomastix" [46]). Mais, Kepler continue, l'influence pernicieuse de Ramus agit aussi sur le grand mathématicien Willebrord Snellius, qui rejette le livre X d'Euclide à cause de son inutilité pour la vie. Kepler reconnaît qu'il a raison, „si on ne reconnaît aucun autre usage que celui de la vie commune, et si les contemplations physiques [47]) ne trouvent aucun emploi dans la vie" [48]). Kepler n'a pas besoin de ce livre X pour „dresser le compte de marchandises, mais pour expliquer les causes des choses". Il fait ressortir que Ramus et Snellius croient que les Éléments d'Euclide ne contiennent que des propositions, des théorèmes: ils font d'un architecte un marchand de bois [49]).

Il nous semble que Kepler caractérise avec beaucoup de justesse la conception ramiste du rôle des mathématiques. Tandis que Kepler traite la géométrie en philosophe [50]), (et il va trop loin, sans doute, dans sa tendance à suivre la métagéométrie des néopythagoriciens), la conception de Ramus est trop empiriste. La tâche du mathématicien n'est pour lui que la compilation et la classification des procédés mathématiques existants. Le mathématicien-usuaire, qui méconnaît l'„utilité" de la joie éprouvée devant la beauté des mathématiques pures, est sans doute un peu philistin [51]).

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[44]) Le jugement téméraire de Schoner sur Euclide ressort de sa préface (écrite en 1599) à l'édition de l'„Arithmétique" et de la „Géométrie" de Ramus: rien n'est plus inutile que le livre X des Éléments d'Euclide: „nullus est inutilior, nullus qui bona ingenia magis ab his studiis deterruerit. Abiecit haec monstra P. Ramus, ob eadem causam deinceps e stereometria vix tertiam partem retinuit", o. c. p. 2.

[45]) J. Kepler, Harmonice Mundi, Linciae 1619; Kepler's Gesammelte Werke, ed. Caspar, T. VI, p. 17.

[46]) Kepler, o.c. p. 82.

[47]) C-à-d. les spéculations sur l'essence des choses!

[48]) Kepler, o.c. pp. 16—18.

[49]) Kepler, o.c. p. 19.

[50]) Kepler, o.c. p. 20.

[51]) Cela n'implique pas que Ramus n'ait jamais éprouvé un grand plaisir en étudiant les mathématiques. Il dit même que de toutes les disciplines ce sont les mathématiques qui donnent la plus grande joie et il emprunte alors les exemples aussi aux mathématiques pures. Oratio de sua profess.; Collect. p. 523.

IX

L',,ASTRONOMIE SANS HYPOTHÈSES"

A. *Critique de l'astronomie.* — Les hypothèses physiques et les hypothèses mathématiques en astronomie. — Copernic et Ramus. — Critique des hypothèses mathématiques en astronomie. — L'astronomie des Égyptiens est sans ,,hypothèses". — Elle doit être restaurée. — B. *Appel à l'astronomie nouvelle.* — Appel à Rheticus et à Tycho. — C. *Interprétation de l'astronomie sans hypothèses.* — D. *L'opinion de Kepler.*

A. *Critique de l'astronomie traditionnelle*

Une des conséquences de l'assassinat de Ramus dans la Saint-Barthélémy et du pillage subséquent de sa bibliothèque est la perte de son livre sur l'astronomie [1]). Il aurait été intéressant, ne fût-ce que du point de vue didactique et méthodologique, car dans l'histoire de l'astronomie Ramus occupe une place modeste à cause de ses idées sur les hypothèses.

Depuis l'Antiquité l'astronomie s'était posé la tâche, sous l'influence de Platon, de ,,sauver les phénomènes", c-à-d. de ramener les voies apparemment irrégulières des planètes à des mouvements circulaires et uniformes [2]). On y parvenait grâce à des cercles excentriques et des épicycles auxquels très souvent on n'attribuait qu'une valeur heuristique. Par conséquent, l'hypothèse ,,mathématique", qui prétendait n'être qu'une aide au calcul astronomique, s'opposait à la conception de l'hypothèse ,,physique", qui prétendait représenter la vraie réalité.

Ramus n'avait aucun préjugé en faveur de l'astronomie traditionnelle qui, en général, concevait les hypothèses ,,mathématiquement". Il tenait Copernic en grande estime et le considérait comme le plus grand astronome de son temps. Mais il regrettait que Copernic eût introduit des ,,hypothèses". Évidemment, Ramus s'était laissé décevoir par la préface anonyme qu'Andreas Osiander avait ajouté au livre de Copernic (1543). Dans cette préface l'hypothèse astronomique est présentée comme un simple moyen de calcul, ne prétendant à aucune réalité physique, et qui était même physiquement fausse. Pourtant, Copernic s'était opposé au fictionalisme d'Osiander; son ouvrage témoigne de son réalisme astronomique, mais son ami Tiedemann Giese craignit déjà que l'on ne considérât le système copernicien comme une fiction commode.

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[1]) v. Testament de Ramus, Waddington o.c., p. 326.

[2]) ,,Ce n'est pas une doctrine juste, mes chers amis, concernant la lune, le soleil et les autres astres, celle qui est accréditée et d'après laquelle ce sont bien des astres errants. Alors que c'est tout le contraire qui est la vérité: chacun d'eux parcourt en effet la même route, et, non pas plusieurs, mais en cercle une seule toujours, tandis qu'en apparence multiple est sa trajectoire". (Platon, Lois VII, 822 A; Oeuvres II, trad. L. Robin).

Cependant, quoiqu'il crût que son système représentât la vérité physique, Copernic se trouva obligé de faire usage des épicycles pour exécuter ses calculs et il introduisit donc des hypothèses qui au moins quelquefois étaient des fictions à son avis aussi. Car Copernic, réaliste ou non, se conformait au dogme absolu de tous les astronomes depuis Platon: il n'admettait au ciel que des mouvements circulaires et uniformes. Son déplaisir à l'égard de l'astronomie de Ptolémée fut même causé parce que ce système ne répondait pas rigoureusement à la condition de l'uniformité des mouvements des astres.

Par conséquent, malgré son admiration profonde pour Copernic, Ramus n'était pas satisfait de son astronomie pour les raisons suivantes:

1⁰ La demande a priori de n'admettre que des mouvements circulaires et uniformes lui semblait une offense contre la méthode saine, un préjugé funeste sans fondement dans la réalité et dans l'observation, une règle erronée du même genre que ces règles des arts du trivium qui ne prenaient pas leur source dans l'usage. Comme il ne pouvait admettre une grammaire qu'après l'étude de la langue parlée, il n'admettait des règles pour l'astronomie qu'*après* la régistration exacte des mouvements des astres.

2⁰ L'idée que l'hypothèse n'est qu'un moyen de calcul, qui ne doit pas nécessairement représenter la réalité physique, était fondamentalement opposée à sa thèse centrale de la conformité de la Nature avec la pensée naturelle. Son goût du concret le poussait à rejeter les ,,fictions'', de sorte que rien que la réalité empirique ne pouvait le contenter.

3⁰ Enfin, l'astronomie appartenant à la *physique*, Ramus n'y voulait pas admettre des hypothèses ,,mathématiques''.

Ramus s'oppose violemment à l'idée que l'on a le droit d'introduire les hypothèses sous prétexte qu'il s'agit là seulement d'une méthode de l'art. Un tel raisonnement lui paraît contraire à la logique d'un art bien fondé. Il espère que l'on choisira des experts de la logique, de l'arithmétique et de la géométrie qui se sont fondés sur l'usage et non seulement sur les préceptes (cela veut dire: qui suivent la méthode inductive au lieu de la méthode déductive!), pour leur demander de trouver, libres des hypothèses et des chimères et avec le seul appui des observations faites par les Anciens et par eux-mêmes, ce qu'il y a de constant dans le ciel. Car, si le ciel est altérable, il sera impossible de construire une telle science [3]).

Ramus voudrait écarter la multitude des cercles excentriques et des épicycles, qui sont „contre la nature", car, d'après lui, l'astronomie est une science fondée sur l'observation et l'expérience qui n'ont pas besoin d'être démontrées par des hypothèses imaginées. La vraie astronomie consiste dans la mesure des mouvements des astres: du *lieu* (par la géométrie) et du *temps* (par l'arithmétique), à partir des expériences simples. C'est donc une „histoire" (cela veut dire: une *description!*) en termes mathématiques. L'observation et le calcul astronomiques ont précédé l'invention des hypothèses, et pour cela il espère que l'astronomie en revient à l'observation et au calcul et abandonne les épicycles hypothétiques qu'il aimerait voir écartés de l'astronomie parce que la nature ne voulait pas les tolérer en les astres [4]).

D'après Ramus, l'astronomie ne se contente plus depuis Aristote des observations directes, mais elle cherche des causes plus profondes aux rétrogradations et aux retardations au ciel. Eudoxe inventa les sphères célestes et les tenait pour naturelles et vraies; puis on inventa les épicycles et les cercles excentriques, et enfin, de notre temps, Copernic, astronome que l'on peut comparer aux Anciens, a rejeté toutes ces hypothèses et rétabli la déduction des mouvements des astres à partir du mouvement de la terre. Or, les hypothèses anciennes et modernes pèsent lourdement sur l'astronomie. Il est certain (le témoignage de Proclus et des interprètes d'Aristote le prouve) que les Babyloniens, les Égyptiens et les Grecs avant Eudoxe n'avaient pas d'hypothèses et étaient tout de même bien capables de prédire les éclipses, de sorte que l'on ne peut pas objecter que les hypothèses sont indispensables au calcul des mouvements célestes [5]).

Il est évident que Ramus était d'autant plus disposé à accepter ce récit, qu'il s'accordait bien avec deux de ses thèses fondamentales: d'abord avec sa conviction que l'astronomie sans hypothèses qui dépeint la réalité naturelle peut être construite à l'aide de la raison naturelle, non encombrée par les sophismes; ensuite avec son opinion que les philosophes très anciens étaient plus proches de cet état naturel, moins sophistes, que les Grecs plus récents!

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[3]) Schol. math. l. II, p. 67.

[4]) Oratio de sua profess.; Collect. p. 526.

[5]) Schol. math. l. II, p. 47. En effet, les Babyloniens avaient découvert la périodicité de beaucoup de phénomènes célestes grâce à la seule observation asssidue de sorte qu'ils pouvaient prédire assez exactement les éclipses et les conjonctions sans inventer d'hypothèses.

Ramus était d'avis que *toutes* les hypothèses sont des fictions absurdes, mais la folie est moins grande chez Eudoxe et Aristote, parce qu'ils tiennent les hypothèses pour vraies; „la fable plus récente selon laquelle la vérité des choses naturelles peut être démontrée à partir de causes fausses, est de beaucoup plus absurde" [6]). Et Ramus pousse sa plainte célèbre, en soupirant qu'il aurait préféré que Copernic eût aidé à construire cette astronomie sans hypothèses, parce qu'il lui aurait été plus facile dans ce cas-là de décrire une astronomie correspondant à la vérité des astres que de mouvoir la terre par un labeur gigantesque. Enfin, Ramus promet sa chaire royale de Paris à celui qui réussira à construire cette astronomie sans hypothèses, et il émet le vœu que d'une des célèbres écoles de l'Allemagne surgisse le „philosophe et mathématicien" qui relèvera son défi [7]).

B. *Appel à l'astronomie nouvelle*

Pour la solution de ce problème il avait pensé d'abord à Georges Joachim Rheticus. En 1563 il écrivit à celui-ci (qui était à Cracovie depuis 1557) pour l'inviter à construire une astronomie sans hypothèses [8]). N'ayant pas réussi à trouver à Paris les hommes et les livres qui pourraient l'aider, la lecture du „Canon" de Rheticus avait éveillé en lui l'espoir qu'il avait fini par trouver enfin l'homme capable d'exécuter ce projet, espoir qui fut renforcé encore par le témoignage d'un de ses disciples polonais, récemment venu de Pologne [9]). Ramus espère que Rheticus, en écartant les hypothèses, rendra l'astronomie „aussi simple que la Nature a fait l'essence des astres" [10]).

Ce fut un choix curieux, car Ramus attribua la préface „fictionaliste" de l'ouvrage de Copernic à Rheticus et pensa donc que Rheticus adhérait au fictionalisme [11]).

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[6]) „... commentum igitur hypothesium absurdum est ... sed tamen commentum in Eudoxo, Aristotele, Callippo simplicius, qui veras hypotheses arbitrati sunt ... At in posteris fabula est longe absurdissima, naturalium rerum veritatem per falsas causas demonstrare". Schol. math. I. II, p. 47.

[7]) „Atque utinam Copernicus in istam Astrologiae absque hypothesibus constituendae cogitationem potius incubuisset, longe enim facilius ei fuisset astrologiam astrorum suorum veritati respondentem describere, quam gigantei cujusdam laboris instar terram movere, ut ad terrae motum quietas stellas specularemus. Quin potius e tot nobilibus Germaniae scholis exoriare philosophus idem et mathematicus aliquis, qui positam in medio sempiternae laudis palmam assequare. Ac si quis caducae utilitatis fructus tantae virtutis praemio proponi possit, regiam Lutetiae professionem praemium conformatae absque hypothesibus astrologiae tibi spondebo: sponsionem hanc equidem libentissime vel nostrae professionis cessione praestabo". Schol. math. l. II, p. 47.

[8]) Schol. math. l. II, p. 63. La lettre est reproduite par Ch. Desmaze, op. cit pp. 68—78.

[9]) Desmaze, o. c. p. 70.

[10]) Ibid. p. 72.

Or, Rheticus était le disciple le plus dévoué de Copernic, en effet le seul disciple direct. Dans sa ,,Narratio prima" (1540) le système de Copernic fut divulgué pour la première fois par la presse et il était convaincu que son maître avait trouvé le vrai système de l'univers.

À l'objection qu'il n'est pas possible de maintenir la ,,dignité" des mouvements célestes (c-à-d. leur cours circulaire et leur uniformité parfaite) et leur supputation sans admettre des hypothèses, Ramus répond que les rétrogradations, les inégalités, etc., appelées ,,anomalies" par les défenseurs des hypothèses, se répètent constamment dans un ordre parfait et n'ont pas besoin de l'artifice des hypothèses. Il est donc possible de fonder l'astronomie exclusivement sur les principes de l'arithmétique et de la géométrie, sans aucune hypothèse [12]). Ramus est d'avis (en accord avec Proclus dans son commentaire sur le Timée) que Platon lui-même n'appliquait pas d'hypothèse en astronomie, mais, puisque (selon les interprètes du livre ,,du Ciel et du Monde" d'Aristote) Platon n'admettait aucune anomalie dans la course des planètes, les astronomes inventèrent les hypothèses destinées à sauver les phénomènes. Ce n'est qu'avec Eudoxe, Aristote et Callippe, qui avancèrent la théorie des sphères concentriques, et ensuite avec les Pythagoriciens, qui (d'après Proclus), introduisirent les épicycles et les excentriques, que les hypothèses apparurent. Il est donc évident que l'astronomie fleurit longtemps sans les hypothèses. En outre, les astronomes sont d'opinion que les épicycles ne sont pas nécessairement physiquement vraies et que, par conséquent, ils ne révèlent pas les *causes* des mouvements. Enfin, Ramus propose à Rheticus de trancher le nœud; il ne faut pas craindre que la beauté de l'astronomie disparaisse avec les hypothèses, car la beauté d'un tableau, obtenue par le recours à de fausses couleurs, déforme la vraie splendeur de la nature, et c'est pour cela que Ramus supplie Rheticus de montrer la splendeur des arts en libérant l'astronomie de la fiction des hypothèses [13]).

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[11]) ,,At hypotheses epicyclorum et eccentricorum commenta falsa et absurda esse, epistola tua, ni fallor, Copernico praeposita, manifeste ex epicyclo Veneris ostendit". Desmaze, o.c. p. 76.

L. Thorndike (A History of magic and experimental science, T. V, New York 1941, p. 413) est d'avis que cette opinion de Ramus pourrait être correcte. Cela nous semble peu probable; d'abord il y a le témoignage de Kepler qui dit le contraire; ensuite, il serait étrange que le disciple le plus intime de Copernic, qui croyait fermement en la réalité de l'image du monde de Copernic, ait eu l'audace d'affaiblir la portée de l'ouvrage de son maître par une telle préface.

L'explication de M. E. Rosen selon laquelle ,,Ramus aurait été de toute manière attiré par l'auteur de la préface, parce que les opinions fictionalistes de celui-ci s'approchaient du désir de son coeur qu'était une astronomie sans hypothèses" (E. Rosen, The Ramus-Rheticus correspondence, JHI vol. I (1940), p. 367) ne nous semble pas bien fondée. Nous avons vu que Ramus les rejette toutes les deux, les hypothèses physiques aussi bien que les hypothèses ,,mathématiques", mais que les premières lui étaient plus sympathiques parce qu'elles prétendent représenter la réalité et parce que c'est à son avis le comble d'absurdité que de vouloir déduire la vérité physique à partir d'hypothèses fausses. Ramus était tout à fait ,,réaliste" et le Rheticus ,,authentique" aurait été plus acceptable pour lui que l'auteur anonyme de la Préface des ,,Révolutions" de Copernic, car celui-là tenait du moins les hypothèses de son maître pour physiquement vraies.

[12]) o.c. p. 72—73.

Malgré le malentendu concernant les opinions de Rheticus, Ramus trouva chez lui un accueil favorable. Rheticus lui écrivit en 1568 qu'il avait enfin le temps d'entreprendre la tâche proposée par Ramus, libérer l'astronomie des hypothèses en se limitant aux observations seules, et qu'il espérait construire une astronomie allemande, une philosophie de la nature, fondée seulement sur la contemplation de la nature, sans se préoccuper des écrits des anciens [14]).

Dans ses Scholae Mathematicae Ramus fit allusion à cette lettre lorsqu'il écrivit que Rheticus (auquel il avait offert l'hospitalité à Paris), s'était montré enclin à venir à l'académie de Paris; et que si la nécessité pécuniaire ne l'eût pas contraint à apprendre à fond et à exercer la médecine, les mathématiques auraient eu déjà un autre Copernic [15]).

En même temps Ramus fit un appel à l'Électeur Auguste de Saxe, afin qu'il chargeât un Copernic, ou Reinhold, ou Regiomontanus d'élaborer le système d'astronomie tant désiré par lui, une astronomie tirée, non pas d'hypothèses fictives, mais de la vérité et de la nature des astres, et fondée exclusivement sur l'arithmétique et la géométrie, comme celle des Chaldéens, des Égyptiens, et des Grecs avant Aristote [16]).

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[13]) Desmaze, o.c. p. 77—78.

[14]) Cf. Rosen, l.c. p. 367; Thorndike o.c. p. 416. M. Thorndike juge inconsistant que Rheticus promit de réduire l'astronomie à ses fondations les plus anciennes et en même temps d'abandonner les hypothèses; qu'il soupirait après Hippocrate et qu'il voulait en même temps un retour à la nature sans se soucier des Anciens. Il nous semble que c'est parfaitement consistant du point de vue ramiste, selon lequel les philosophes les plus anciens (les Hippocrate, les „Hermès", etc.) étaient beaucoup plus proches de la „nature" que les philosophes postérieurs (les Aristote, p. e.).

[15]) „. . . et literis nostris ad studium liberandae hypothesibus Astrologiae incitatus spem quoque illustrandae Parisiensis academiae dederat: ac nisi medicinam maecenatis cujusdam perdiscere et exercere coactus esset, jampridem alterum Copernicum mathemata celebrarent". Schol. math. lib. II, p. 63.

[16]) Schol. math. l. II, p. 67.

Un autre célèbre astronome fut encore abordé par Ramus. À Augsbourg il rencontra en 1570[17]), grâce à l'intermédiaire de son élève Jerôme Wolf, le jeune Tycho Brahé (1546—1601), qui était allé à Nuremberg et à Augsbourg pour y faire construire des instruments par les meilleurs ouvriers du temps. Reconnaissant le génie de Tycho, Ramus s'efforça de le persuader d'exécuter son projet chéri d'une „astronomie sans hypothèses" [18]). Il paraît que Ramus s'était de nouveau référé aux Egyptiens qui auraient eu une astronomie plus facile que celle qui fait usage des hypothèses. (Comme d'ordinaire, l'argument didactique jouait donc un rôle considérable dans l'argumentation de Ramus!). Tycho, pourtant, fit ressortir qu'il n'était pas possible de réduire les phénomènes célestes à une science certaine ni de les comprendre sans l'aide des hypothèses. Il eut l'impression (juste!) que Ramus n'était pas versé dans l'astronomie. Tycho remarqua plus tard (en 1587) que l'idée de Ramus a encore beaucoup d'adhérents mais qu'ils travailleront en vain, et que, souvent, ils ne s'entendent nullement à cette matière. Sans nombre, poids, et mesure nous ne comprenons rien au monde visible. Or, les hypothèses sont la mesure des mouvements apparents, par moyen de cercles et d'autres figures, résolues en nombres par l'arithmétique. Comprendre les mouvements des astres sans elles requerrait une intelligence surhumaine [19]).

L'éditeur moderne des oeuvres de Tycho, l'astronome J. L. E. Dreyer, fut d'avis que Tycho n'avait pas compris Ramus. D'après lui, Ramus aurait demandé seulement une théorie des mouvements qui ne fût fondée que sur l'observation et non pas sur des hypothèses préconçues par l'esprit (comme l'axiome, généralement admis jusqu'alors, des mouvements circulaires) [20]). Tycho, bien qu'il ait rejeté cette proposition, fut néanmoins incité par elle à poursuivre les efforts qui devaient aboutir à sa nouvelle doctrine [21]).On pourrait ajouter que, grâce aux observations de Tycho, le problème allait être résolu, dans un certain sens, par Kepler.

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[17]) C'était donc peu de temps après la parution des trois premiers livres des Scholae Mathematicae en 1567. Les trois premiers livres des Scholae Mathematicae (1re éd. 1569), auxquels nous avons emprunté la plupart de nos citations des „Scholae", furent publiés déjà en 1567 à Paris sous le titre de „Prooemium Mathematicum. Ad Catharinam Medicaeam reginam, matrem regis".

[18]) Tycho Brahé à Chr. Rothmann (1587); Tychonis Brahei Opera omnia VI, pp. 88—89.

[19]) Tycho, l. c. p. 89.

[20]) Tychonis Opera vol. I, p. X; vol. VI, p. 353.

[21]) Tychonis Opera vol. I, p. X.

C. *Interprétation de l'„astronomie sans hypothèses"*

Ici se pose la question de savoir quelle est la signification précise de „l'astronomie sans hypothèses" de Ramus?

Pour y répondre nous disposons de quelques points qui sont hors de doute:

1° Ramus rejette toute hypothèse qui ne veut être qu'un moyen de calcul et ne prétend aucunement à la vérité physique. C'est une différence avec Proclus, que Ramus blâme parce qu'il admet l'hypothèse des épicycles comme un outil légitime de l'astronomie, tout en repoussant l'idée qu'ils pourraient être physiquement vrais[22]). Du reste, Proclus, bien qu'il maintînt le bon droit des hypothèses fictives, croyait néanmoins que seul le mouvement complexe et indécomposé de chaque astre est réel; les mouvements réels sont donc ceux-là qui se manifestent à nous; par les hypothèses nous aurons simplement rendu les mouvements des astres accessibles au calcul[23]). Cette conception de Proclus est l'exacte contre-pied de celle de son maître Platon.

2° Ramus rejette tout mouvement composé. Les hypothèses d'Eudoxe et d'Aristote sont condamnées (bien qu'elles fussent conçues comme physiquement vraies par leurs auteurs), parce qu'elles sont trop compliquées et, par conséquent, contraires à la simplicité de la nature[24]).

3° La question qui reste est maintenant la suivante; supposé que l'astronomie doive décrire mathématiquement l'orbite vraie et unique parcourue par un astre, avec quel point de repère cette orbite doit-elle être mise en rapport? C'est-à-dire est-ce que Ramus exige absolument que le mouvement se rapporte à la terre, et, par conséquent, qu'on trouve la loi mathématique du mouvement indécomposé qui se manifeste à nous et qui seul est reconnu comme réel? Dans ce cas il se serait rangé du côté de Patrizzi[25]).

Ou aurait-il accepté le système héliocentrique et le mouvement de la terre et aurait-il espéré une orbite planétaire plus simple que celle que l'observation directe nous montre? On serait en droit de ne pas écarter cette possibilité parce que Ramus ne manifeste pas de préjugé enraciné contre le mouvement de la terre. Il le considérait physiquement plausible et dit que Copernic „le plus grand astronome de notre temps, a ôté au ciel tout mouvement, et par le seul mouvement de la terre, il mesure le temps beaucoup plus exactement qu'aucun astronome ne l'a fait jusqu'aujourd'hui" [26]).

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[22]) Lettre à Rheticus, Desmaze, o. c. pp. 76, 77.

[23]) Cf. P. Duhem, Essai sur la notion de théorie physique de Platon à Galilée. Paris 1908, p. 20; P. Duhem, Le Système du monde II, p. 103—106.

[24]) Aristote explique le mouvement d'une planète par une combinaison de sphères homocentriques tournant avec des vitesses différentes mais uniformes, autour d'axes différemment orientés.

[25]) Et il aurait partagé l'opinion de Proclus, mais en allant plus loin que celui-ci, qui voulait admettre les hypothèses comme moyen de calcul.

Quant à Rheticus, lorsqu'il annonce qu'il va élaborer une astronomie sans hypothèses, l'on peut à peine croire qu'il pensait à quelque chose qui ressemblât à l'idéal de Patrizzi d'une description mathématique de la voie immédiatement observée. Rheticus était un copernicien convaincu et donc familier avec l'idée que tous les mouvements se rapportent au soleil et que ces rapports sont „physiquement vrais". L'accueil favorable qu'il fit à la demande de Ramus n'est plus étonnant alors. Il va sans dire qu'un réaliste copernicien souhaitait ardemment écarter de l'ouvrage de Copernic jusqu'aux derniers restes d'hypothèses (dans le sens de cercles fictifs). C'est précisément le même idéal qui inspira Kepler à amender le système de Copernic et qui aboutit de sa part à la proclamation des orbites elliptiques. Et Kepler lui-même, en 1609, crut fermement avoir résolu par là le problème de Ramus!

D. *L'opinion de Kepler*

Kepler l'avait prétendu déjà prématurément, en 1597, lorsqu'il avait achevé son „Mysterium Cosmographicum". Il écrivit alors à son ancien précepteur, Michael Mästlin, que Ramus avait promis de céder son professorat à celui qui aurait inventé une astronomie sans hypothèses. Si Ramus désirait une astronomie sans des hypothèses que l'on doit postuler au lieu de prouver afin qu'on puisse les croire, et s'il fait l'éloge de cette astronomie-là, qui n'est contente que si elle a trouvé des orbites naturelles, la chaire de Ramus revenait à lui, Kepler, ou à Copernic, ou à tous les deux. Si, au contraire, Ramus rejette toute hypothèse, les vraies et naturelles autant que les fausses, il est stupide. Mais, ajoute Kepler, je préfère m'appeler, moi, professeur royal plutôt que d'appeler Ramus stupide [27]).

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[26]) Schol. phys. l. IV, c. 14; col. 738.

[27]) Lettre de Kepler à Mästlin, Graz, Octobre 1957; Kepler, Gesammelte Werke, ed. Caspar, T. XIII, München 1945, p. 141. Comme Mästlin ne comprit rien de cette plaisanterie et qu'il la prit au sérieux (Mästlin à Kepler, Tübingen 30 oct. 1597), Kepler fut obligé de s'expliquer. Ramus promet un professorat royal à celui qui construira une astronomie sans hypothèses; Kepler a construit une astronomie

Pour Kepler, (qui est aussi réaliste en astronomie que Ramus), l',,hypothèse astronomique'' doit être identique à la vérité physique. Il écrit en 1602 à David Fabricius qu'il n'énonce pas d',,hypothèses'' (ou, ce que Ramus appelle ,,fantaisies'') mais la vérité elle-même, et, ,,à part celle-là je ne suppose rien . . . Jugez si je n'ai pas fait un pas vers la constitution d'une astronomie physique sans hypothèses, c-à-d. sans hypothèses fictives'' [28]).

Mais plus tard, Kepler reconnut qu'il avait un peu trop tôt crié au triomphe. Ce n'était qu'en 1609, qu'en se servant des observations faites par Tycho, qu'il fut tellement convaincu d'avoir résolu dans son ,,Astronomia Nova'' (qui, selon lui, ,,ouvrit la voie à la réformation de toute l'astronomie''), le problème posé par Ramus, qu'il osa l'annoncer publiquement. Alors il fit précéder le livre du passage des ,,Scholae Mathematicae'' où Ramus souhaite que Copernic se fût attaché plutôt à construire une astronomie sans hypothèses et où il se demande pourquoi de tant d'écoles nobles de l'Allemagne ne provient aucun philosophe et mathématicien pour le faire. Et Kepler répond triomphalement: ce livre-ci me donnerait droit à la chaire de Ramus s'il était encore vivant. Il reconnaît que c'est une fable absurde que de démontrer les choses naturelles par des causes fausses, mais cette erreur n'est pas dans Copernic, car celui-ci croyait ses hypothèses physiquement vraies; l'inventeur de cette fable est Andreas Osiander qui écrivit cette préface que Ramus appelle très absurde [29]).

Après tout ce que nous venons de dire il est évident que Kepler n'attribuait pas non plus à Ramus la conception d'une ,,astronomie sans hypothèses'' telle qu'on la trouve chez Patrizzi. D'après Kepler il y a trois choses en astronomie: 1° les hypothèses *géométriques* (moyens de calcul qui ne prétendent aucunement de représenter la vérité physique). 2° les hypothèses *astronomiques* (qui prétendent représenter la réalité physique); 3° les mouvements apparents des astres. L'astronome doit donc construire des hypothèses *astronomiques* d'où s'ensuivent les mouvements apparents, et des hypothèses *géométriques*

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sans hypothèses; ergo, Kepler a droit au professorat royal. — Ramus désire ou une astronomie sans aucune hypothèse, ou seulement sans de telles hypothèses que l'on ne peut pas prouver. Si la première éventualité est vraie, Ramus est stupide; mais si la seconde est vraie, voilà que Copernic avait émis des hypothèses que lui, Kepler, a démontrées depuis et, par là, il a donc satisfait à la demande de Ramus. (Kepler à Mästlin, Graz, 6 janv. 1598; Werke, ed. Caspar, T. XIII, p. 165.

[28]) Kepler à Fabricius, Prague, 1 oct. 1602; Werke, ed. Caspar, T. XIV, p. 280.

[29]) J. Kepler, Astronomia Nova, 1609; Gesammelte Werke, ed. Caspar, T. III, München 1937, p. 6.

à partir desquelles les vrais mouvements des planètes (c.-à.-d. les hypothèses astronomiques!) peuvent être calculés [30]).

Patrizzi, cependant, rejette toute hypothèse et ne reconnaît comme vrais que les mouvements apparents [31]).

Pourquoi Kepler ne veut-il pas admettre l'opinion de Patrizzi? Premièrement, parce que les conceptions naïves qui se fondent exclusivement sur la vue immédiate, sont souvent trompeuses; deuxièmement, parce qu'il est plus probable que Dieu ait mis dans la nature les mouvements assez simples et réguliers qu'exige l'hypothèse astronomique que les mouvements confus et très compliqués observés par la vue directe. *L'observation astronomique* („l'astronomie mécanique et pratique") détermine les mouvements apparents, mais c'est la *réflexion astronomique* qui aboutit à la découverte des orbites vraies, quoiq'en disent Osiander et Patrizzi, et c'est la *géométrie* qui invente des cercles et des lignes pour calculer les vrais mouvements [32]).

Ceci nous met en présence d'un autre problème encore. Jusqu'à quel point la croyance a priori en la *simplicité de la nature* doit-elle conditionner ce qu'il faut accepter naïvement parmi les données de l'expérience directe? Ramus soutenait, lui aussi, la simplicité de la nature à l'encontre de la complexité des hypothèses astronomiques, mais il était d'avis qu'il ne nous est pas donné de fixer le degré de simplicité que Dieu a observé lors de la création. Mais Kepler lui-même, en se soumettant aux données de l'observation, abandonna les mouvements uniformes et circulaires pour les mouvements non-uniformes selon des trajectoires elliptiques; lui aussi, il découvrit la qualité de la simplicité de la nature en s'adaptant a posteriori aux résultats de l'observation. Par conséquent, il demeure impossible de trancher définitivement la question de savoir si Ramus se serait rangé du côté de Kepler, bien que nous soyons enclin à accepter l'interprétation que Kepler [33]) a donnée du sens du fameux problème raméen.

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[30]) J. Kepler, Apologia Tychonis contra Ursum (1600), cap. I; Opera Omnia Kepleri, ed. Ch. Frisch, T. I, Frankfurt 1858, p. 246. Sur cet ouvrage intéressant de Kepler, qui mériterait de figurer au programme des lycées, cf. R. Hooykaas, Het hypothesebegrip van Kepler, Orgaan der chr. vereeniging van natuur- en geneeskundigen in Nederland, 1939, pp. 38—60.

[31]) Ibid. p. 247.

[32]) Ibid. p. 248.

[33]) Et J. L. E. Dreyer.

X

APOLOGIE DES MATHÉMATIQUES

L'enseignement des mathématiques dans l'Antiquité. — L'étude des mathématiques un devoir religieux. — A. *L'utilité des mathématiques.* — Critique de la conception anti-utilitaire de Platon et d'Archimède. — Relations des mathématiques pures et appliquées. — La pratique préférable à la théorie. — Critique des opinions de Quintilien et des Pythagoriciens. — La „géométrie pratique" au Moyen Âge. — Exemples de l'application des mathématiques en France, en Allemagne. — B. *La restauration du quadrivium.* — La situation de l'enseignement mathématique au temps de Ramus. — L'enseignement aux universités de l'Angleterre, de l'Allemagne, de la Suisse. — Exhortation à l'adresse de l'Italie.

L'enseignement mathématique, quoique faisant partie intégrante des arts libéraux, fut négligé aux universités, et l'humanisme, à part l'école de Mélanchthon, n'avait pas réussi à le rétablir. Il fallait donc une apologie pour justifier les mathématiques aux yeux des scolastiques et des humanistes. Plusieurs ouvrages mathématiques du XVIe siècle commencent en démontrant que les mathématiques ne sont pas impies, qu'elles ne sont pas superflues, mais que, au contraire, elles contribuent à la gloire de Dieu et au bonheur de l'humanité, et — argument spécialement convaincant dans un siècle humaniste — que les grands philosophes classiques les tenaient en honneur. Mélanchthon avait donné l'exemple par ses préfaces mathématiques; Venatorius, Santbech, Léonard Digges, et Ramus l'ont suivi.

Ramus, en idéalisant l'Antiquité, croit que les mathématiques florissaient extraordinairement parmi les Hébreux, les Égyptiens, les Grecs et les Romains, et que ces peuples formaient l'esprit de leurs enfants en leur enseignant les mathématiques [1]). Il fait remarquer que Pythagore et Platon n'admettaient personne dans leurs écoles qui ignorait la géométrie. Il croit qu'Aristote, lui-même disciple de Platon, n'aurait pas reçu de telles gens au Lycée et qu'il déplaît aux mânes d'Aristote qu'il y ait aujourd'hui des philosophes aristotéliciens qui jugent les mathématiques inutiles à la philosophie péripatéticienne [2]).

Ce qui plus est, l'Écriture Sainte, d'après Ramus, nous incite aux études mathématiques, car Dieu lui-même fit de la géométrie en créant le monde. Le prophète Ezechiel donne les mesures exactes de la cité sainte. Il y a, de même, des textes de l'Écriture à l'appui de l'optique et la géographie. Et si les dieux des païens voulaient être glorifiés par les mathématiques (le problème délique) et désiraient que les hommes fûssent des mathématiciens, d'autant plus le veut le vrai Dieu [3]). Que ceux qui ne connaissent pas les lumières mathématiques, et de même les Bonifaces [4]), qui les haïssent, viennent à „l'école mathématique", afin d'attribuer plus clairement et plus purement la gloire à Dieu, et qu'ils écoutent plus attentivement les louanges que l'on chante chaque jour devant Dieu dans les temples: „Les cieux racontent la gloire de Dieu". Toutes ces choses dans la nature et l'Écriture ne peuvent guère être vues clairement sans les mathématiques; que nul théologien ne juge donc les mathématiques inutiles ni ne les calomnie même comme impies [5]).

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[1]) Praef. math. secunda; Collect. p. 169.
[2]) Schol. math. p. 121.

A. *L'utilité des mathématiques*

Ramus va encore plus loin; il fait ressortir aussi que l'application des arts libéraux aux arts mécaniques rend ceux-ci plus recommendables, car il est d'avis que la floraison des arts appliqués et le bien-être des arts purs sont indissolublement liés [6]).

Une fois de plus l'Antiquité donne le bon exemple. Ramus dit qu'alors les artisans, les peintres et les architectes, comme Apelle et Vitruve, non seulement possédaient la théorie et la pratique des mathématiques, mais ils écrivaient même des livres [7]).

Pourtant, quant à l'appréciation des applications utiles des mathématiques, ou même quant au sentiment que ces applications existent, les anciens philosophes ne sont pas tous sans blâme et Ramus se trouve même obligé de critiquer à cet égard Platon, qui lui est pourtant si cher. Tant qu'il s'agit de défendre l'importance des mathématiques contre les scolastiques et les humanistes, indifférents parce qu'ils ne s'intéressent qu'à la rhétorique (éloquence), Platon est son allié, et Ramus mentionne maintes fois triomphalement qu'il n'admettait nul homme sans connaissance de géométrie dans son académie [8]). Mais il lui faut reconnaître que Platon avait autant recommandé aux philosophes de s'occuper des mathématiques qu'il leur avait déconseillé de s'occuper de leur application: „Platon se réjouissait autant des *contemplations* mathématiques qu'il méprisait leur emploi populaire et vulgaire, et il croyait qu'Eudoxe et Archytas se souilleraient par des travaux mathématiques manuels"[9]). Il remarque aussi que, bien que Platon fût contre l'étude de la mécanique, Aristote la recommandait, parce que l'utilité publique avait plus de poids auprès de lui que l'autorité de Platon[10]). Ici se révèle de nouveau l'esprit libre de Ramus, qui, tout en étant un admirateur fervent de Platon et un adversaire fougueux d'Aristote, n'hésite pas à blâmer son héros et à louer son adversaire, si les circonstances l'exigent. Ramus conclut qu'Aristote, puisqu'il enseignait la mécanique et publiait un livre sur ce sujet, l'emporte à cet égard de beaucoup sur Platon, Archytas, et Eudoxe[11]). À en croire Plutarque, le grand Archimède, qui montrait par tant d'exemples admirables l'usage pratique à faire de la géométrie, partageait quand même cette opinion de Platon; il semble que le grand mathématicien ne construisait des appareils mécaniques que parce que la patrie l'exigeait et qu'il ne voulait écrire aucun livre de mécanique[12]). Ramus le regrette vivement; il aurait souhaité qu'Archimède eût reconnu „que la fin des arts est dans l'usage, non pas dans la contemplation" et qu'il eût préféré ce qui est utile à l'homme à une opinion erronée; la postérité posséderait dans ce cas non seulement des théorèmes très profonds, mais aussi les fruits de ceux-ci, qui sont beaucoup plus agréables et souhaitables pour la vie humaine[13]). Ramus s'emporte tellement qu'il parle même de la „jalousie"[14]) de Platon et dit que „cette partialité aveugle de Platon a failli faire périr non seulement l'„usage" (les applications) de la géométrie, mais cette science elle-même"[15]).

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[3]) Schol. math. p. 49.

[4]) Cf. R. Hooykaas, Science and theology in the Middle Ages, F.U.Q. *3* (1954), p. 147 seq.

[5]) Schol. math. p. 49.

[6]) Schol. math. p. 28.

[7]) Collect. p. 170.

[8]) Schol. math. lib. I, p. 12.

Il croit pourtant que, n'en déplaise à Plutarque, Archimède a bien écrit quelques ouvrages de mécanique[16], et il cite aussi un texte dans lequel Platon proclame *l'utilité* du calcul dans le domaine de la stratégie; il le considère alors „le vrai Platon, animé par l'esprit platonien[17]).

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[9]) Schol. math. l. II, p. 50.
[10]) Schol. math. l. I, p. 20.
[11]) o. c. p. 21.
[12]) o. c. p. 28.
[13]) o. c. p. 28.
[14]) o. c. p. 50.
[15]) o. c. p. 28.
[16]) Schol. math. I, p. 29.
[17]) Schol. math. l. II, p. 53. Platon dit: „Aussi, n'est-ce pas, repris-je, pour un homme de guerre nous admettrons que c'est un nécessaire objet d'étude aussi, d'être capable de nombrer et de calculer? Et même, dit-il, entre tous, le plus hautement nécessaire, si l'on veut qu'il entende quoi que ce soit à régler l'ordre des troupes" (République VII, 522 E). D'après Platon, le gardien de l'état doit être,

Ainsi il satisfait au besoin humaniste d'ériger les Anciens en héros exemplaires.

Selon Ramus, tant qu'on avait appliqué la géométrie dans la pratique, les études et la connaissance de la géométrie florissaient également, mais dès que l'on s'était mis à négliger de traiter dans les écoles l'usage de la géométrie, la géométrie elle-même commença aussi à tomber dans le mépris peu à peu [18]). Et Ramus estime que, pendant 1500 ans, rien d'important n'a été ajouté aux mathématiques et que les écrits d'une grande partie des auteurs grecs ont disparu [19]).

L'on reconnaît l'humaniste à ce trait: Ramus montre d'ordinaire peu d'appréciation pour tout ce qui a été fait entre l'Antiquité et la Renaissance de la culture classique des XVe et XVIe siècles. Cependant, il défend l'opinion de Philopon sur le mouvement des projectiles [20]); il cite parfois Jordanus Nemorarius sur les propriétés du levier [21]), et Joannes Tzetzes, un Byzantin du commencement du XIe siècle [22]), ainsi que les opticiens du Moyen Âge, Alhazen, Vitellion, Peckham [23]).

L'historien moderne ne peut qu'admirer les efforts de Ramus pour établir des rapports entre les sciences théoriques et les sciences appliquées: Ramus reconnaît que, l'usage des sciences mathématiques dans la vie commune étant tombé dans l'oubli, les sciences pures en subissent la répercussion; les manuscrits mathématiques ne sont plus gardés soigneusement, les études elles-mêmes s'atrophient. Quoiqu'il ne voie pas clairement la continuïté entre la „nouvelle" science et les meilleures traditions du Moyen Âge et qu'il pense renouer directement avec la science d'il y a 1500 ans, il reconnaît que cette renaissance ne

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à la fois, un homme de guerre et un philosophe: or, l'homme de guerre a besoin, pour ordonner ses troupes, d'avoir étudié la logistique (d'avoir pratiqué les opérations numériques) (Rép. VII, 525 B). Il faut que le gardien de l'état étudie la science du calcul (la „logistique") et celle des nombres (l'„arithmétique" théorique); la science du calcul tant pour faire la guerre que pour se préparer à la science des nombres, à la philosophie (cf. Rép. VII, 525 B-C). De même, Platon s'intéresse à tout ce qu'il y a en *géométrie* qui vise les choses de la guerre, „car, pour l'établissement d'un camp pour le siège d'une place, pour la concentration ou le déploiement d'une armée, pour tout ce qu'encore un plan de bataille, un ordre de marche, comportent en eux-mêmes de figures, il doit y avoir une différence, de l'un à l'autre, entre le général qui est géomètre et celui qui n'est pas" (Rép. VII, 526 D.). Et, attendu que même cet „à-côté" de la géométrie, son application à la guerre, ne soit pas sans importance, Platon est d'avis que l'étude de la géométrie doit être obligatoire pour les citoyens (Rép. VII, 527 C).

[18]) Schol. math. lib. I, p. 28.

[19]) Ibid.

[20]) Schol. phys. lib. IV, c. 8.

[21]) „Jordani hac de re luculenta demonstratio". Schol. math. II, p. 57.

[22]) Schol. math. p. 55.

[23]) Dans l'„Optique" de Reisner et de Ramus.

peut s'effectuer et porter fruit que si l'on établit un lien étroit avec la tradition des artisans, tradition qui s'était développée pourtant considérablement depuis l'Antiquité.

Quoiqu'il en soit, quand les mathématiques, tout en figurant au programme des études, ne sont guère enseignées, on ne peut pas nourrir l'espoir qu'elles féconderont les travaux techniques, ou qu'elles seront fécondées par eux. Et voilà précisément la situation que Ramus trouva et dont il se plaignit. Selon lui, après l'Antiquité les mathématiques sont tombées en désuétude, de sorte que non seulement les enfants et les artisans, mais les doctes non plus n'en connaissent presque jamais les éléments; aujourd'hui presque personne ne les applique selon cet ancien usage, comme une enquête nous l'a démontré 24). Un ,,indocte" a eu l'intrépidité de maintenir devant toute l'université de Paris que les arts mathématiques n'ont point de fin pratique, qu'on ne peut s'attendre à aucune ,,utilité populaire" de sa part, et il a même eu l'audace de faire imprimer cette ,,folle calomnie" 25.

Cet homme ,,indocte" c'était sans doute Jacques Charpentier, qui, comme Ramus dit dans un écrit dirigé contre lui, ,,crie tous les jours, voire publie par ses escrits imprimez, que de penser comme faisoit Socrate, que les mathématiques se debvoient rapporter à l'usage de la vie humaine, que c'est une grande erreur; et dit que bien compter et mesurer sont les ordures et fientes des mathématiques" 26).

Cependant, selon l'opinion de Ramus, il est évident que l'expérience particulière et le maniement des choses est plus utile que la démonstration générale et la contemplation universelle 27). Ici, on croit apercevoir des traces du nominalisme tant critiqué par les humanistes! 28)

Ramus croit qu'il faut préférer les arts appliqués aux arts libéraux

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24) Praef. math. sec.; Collect. p. 170.

25) Schol. math. l. II, p. 50.

26) Remonstrance au conseil privé (1567); v. Waddington, o.c. p. 416. Charpentier, l'ennemi mortel de Ramus, fut protégé par les jésuites et les Guise (le cardinal Charles de Lorraine) (Waddington, o.c. pp. 167, 170, 180, 181). En 1566 il avait pris possession de la chaire royale de mathématiques, qu'il avait acheté de son prédécesseur (Waddington, o.c. p. 172, 169, 266; Ramus, Remonstrance, v. Wadd. p. 411). Celui-ci ne savait pas parler latin, Charpentier ignorait les mathématiques· ni l'un ni l'autre fut donc acceptable (v. Wadd. p. 172). Charpentier monta en chaire de mathématiques, quoiqu'il eût avoué ouvertement sa profonde ignorance en grec et en mathématiques et quoiqu'il eût même affecté um mépris pour les mathématiques (v. Waddington, o.c. pp. 173, 175). Il ,,n'en sçavoit totalement rien, et n'en avoit fait ny estude ny profession aucune, ains au contraire s'en estoit tousjours mocqué, comme si les mathématiques estoient quelques abstractions phantastiques qui n'apportassent aucune utilité à la vie humaine". (Ramus, Remonstrance; v. Wadd. o.c. p. 412).

27) Schol. math. II, p. 50.

28) Voyez pourtant la note au début de VIII B, ci-dessus.

dont ils sont les applications: la logistique (l'art pratique de calculer) à l'arithmétique (la théorie des nombres), la géodésie à la géométrie, la nautique à l'astronomie [29]). On ne devient pas riche par la contemplation de richesses, mais en utilisant les richesses et on ne devient pas bienheureux par la connaissance de la béatitude, mais en recueillant ses fruits [30]).

Ensuite Ramus parle de l'opinion d'Aristippe et de Quintilien qui, d'après lui, ont prétendu que les mathématiques sont bonnes à aiguiser l'esprit, mais qu'elles ne sont d'aucune utilité pour l'action pratique [31]). Et aujourd'hui, même ceux qui reconnaissent que les éléments de mathématiques sont utiles à l'éducation, partagent cette opinion et voudraient limiter leur usage au seul exercice de l'esprit [32]).

Cependant, Ramus pense qu'il ne faut pas confondre cette opinion de Quintilien avec celle de Platon qui déconseille aux philosophes de communiquer les sciences aux artisans indoctes: l'ignorance d'Aristippe diffère beaucoup de la jalousie (zelotypia) de Platon [33]).

La doctrine d'un des philosophes que Ramus blâme si franchement, celle d'Aristippe de Cyrène, disciple de Socrate, est bien difficile à reconstituer, mais un point reste hors de doute, c'est le mépris qu'il professait pour les mathématiques [34]).

Quintilien (c. 35—c. 96), rhétoricien, pédagogue, philosophe, exerça une influence considérable sur l'humanisme après la découverte d'un manuscrit de son „Institutio oratoria" en 1416. Quintilien dit en effet que selon l'opinion vulgaire la géométrie est utile aux enfants pour aiguiser l'esprit, mais qu'elle n'a aucune utilité après [35]). Il faut remarquer, cependant, que Quintilien ne semble pas exprimer ici sa propre opinion: il ne fait que rendre compte de l'opinion courante, car il rejette ailleurs l'idée que les mathématiques n'ont qu'une valeur formelle pour l'éducation; elles sont, au contraire, d'une importance pratique [36]).

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[29]) Ibid.

[30]) Ibid.

[31]) Schol. math. II, p. 50.

[32]) Praef. math. secunda; Collect. p. 170.

[33]) Schol. math. p. 50.

[34]) P. Brunet et A. Mieli, Histoire des Sciences, Paris 1935, p. 215.

[35]) „In geometria partem fatentur esse utilem teneris aetatibus: agitare namque animos et acui ingenia et celeritatem percipiendi venire inde concedunt, sed prodesse eam non ut ceteras artes cum perceptae sint sed cum discatur, existimant [id vulgaris opinio est]". Quintilianus, Institutio oratoria l. I, 10, 32.

[36]) Instit. orat. I, 10, 3 suiv.

Ramus combat également ces mathématiciens qui, comme les Pythagoriciens, attirés par les contemplations et les démonstrations, méprisent l'usage et considèrent des fantaisies tout à fait abstraites du monde sensible comme l'objet des mathématiques [37]). Il rejette donc les spéculations mystiques sur les proportions et les nombres, les ,,métamathématiques'' si chères aux néopythagoriciens et aux néoplatoniciens de la Renaissance. Il faut avouer, cependant, que cette attitude critique le rend en même temps incapable d'apprécier une légitime théorie des nombres. Son objection contre ces mathématiciens c'est qu'ils cherchent la compréhension des choses physiques et politiques à l'aide de leurs spéculations sur l'essence des entités mathématiques, et qu'ils pensent en même temps que toute action et manipulation est loin du but des mathématiques [38]). Il est d'avis qu'il est contre le bon sens de chercher de l'or dans la terre tout en négligeant de cultiver des légumes; les contemplations des arts libéraux sont comparables à l'or, mais l',,usage'' des arts est une chose nécessaire et les contemplations ont été inventées en vue de l'usage. Les mathématiques existent non seulement pour la philosophie (la science) des choses physiques et politiques, mais pour l'*action*, dit Ramus [39]), à l'encontre de l'enseignement de Platon! [40])

Il faut se rappeler que la ,,géométrie pratique'' avait déjà pris place parmi les discussions sur les arts chez les auteurs médiévaux. En 1130 environ, Hugues de St Victor, dans sa ,,Practica Geometriae'', présenta la géométrie soit comme théorique, lorsqu'elle fait appel à la seule investigation rationelle, soit comme pratique, lorsqu'elle fait usage d'instruments [41]). La mesure des circonférences de la sphère céleste et du globe terrestre relève également de la dernière. Un peu plus tard, Domenicus Gundissalinus, dans son ,,de divisione philosophiae'', affirme que la géométrie théorique étudie la grandeur hors de l'univers sensible et la géométrie pratique dans l'univers sensible (extra materiam, in materia). La géométrie théorique a pour fin d'enseigner quelque chose, la géométrie pratique a pour fin de faire quelque chose; l',,agent'' (artifex) de la géométrie théorique est le géomètre, et son instrument est la démonstration; les ,,agents'' de la géométrie pratique sont les mensurateurs et les artisans (fabricants, charpentiers, forgerons, maçons, etc.)[42]. Niccolo Tartaglia (1505—1557) distinguait à son tour l'arithmétique théorique, traitée par Euclide, et ayant pour objet la qualité, la quantité, la proportion des nombres, et l'arithmétique pratique, traitant le calcul, donc des actions ayant rapport aux divers métiers et au commerce[43].

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[37]) Schol. math. p. 50.

[38]) ,, . . . ab actione autem et machinatione prorsus amovenda''. Schol. math. p. 51.

[39]) Schol. math. p. 51.

[40]) Voyez plus haut VIII D, vers la fin.

[41]) Cf. R. Baron, Sur l'introduction en Occident des termes ,,geometria theoretica et practica''. Rev. Hist. Sc. *8* (1955), pp. 298—302.

La distinction faite par Ramus n'a donc rien de nouveau: il continue une tradition médiévale qui n'est pas anti-utilitaire. Mais la *préférence* accordée à la géométrie pratique inaugure une nouvelle tradition positivement utilitaire, qui n'est ni médiévale, ni humaniste.

Ramus a donné à ses contemporains des preuves convaincantes de l'utilité pratique des „arts mathématiques". Il se plaît à s'étendre spécialement sur leurs applications dans la vie bourgeoise des villes et dans l'administration du royaume. Comme exemple il choisit une ville, celle de Paris et il invite ses lecteurs à l'accompagner dans la rue principale, la rue St Denis, qui est habitée par de riches marchands, qui font le commerce avec les provinces et l'étranger (l'Italie, l'Espagne. l'Allemagne, la Flandre, et l'Angleterre), et qui ont à faire à une grande variété de monnaies, poids, et mesures, ce qui peut poser des problèmes dont la solution dépend de l'arithmétique. Si l'on va plus loin dans la direction du palais royal, on arrive au pont des orfèvres, et ces orfèvres vous diront quelle est la science qui leur enseigne comment allier l'or à l'argent et au cuivre et comment déterminer la composition des alliages: c'est la science d'Archimède. Plus près encore du palais l'on trouvera les offices du Trésor royal[44] où l'on ne découvrira que des maîtres d'arithmétique, des trésoriers et des juges qui fixent équitablement les impôts à payer par les provinces[45]. Par conséquent, n'en déplaise aux Aristippe qui jugent l'arithmétique inutile et sans aucune utilisation populaire, l'Arithmétique est nécessaire au commerce, à la fabrication des alliages, et pour résoudre des questions fiscales en temps de paix, tandis qu'elle rend service à la stratégie en temps de guerre[46].

De même la Géométrie a, elle aussi, son but et son usage populaire; son but est de bien mesurer, et elle pénètre donc toute la géodésie et toute la mécanique. Il y a tant de petites machines (par exemple, la pince, les ciseaux), qui sont en fait de grandes œuvres et qui rendent la vie commode, mais qui, parce qu'elles sont utilisées chaque jour ne sont point admirées. Les instruments de la géométrie mécanique, la vis et le levier, sont employés pour soulever des fardeaux, pour fendre le bois et le marbre, pour les presses d'huile, etc. Ils sont utilisés par les navigateurs, les architectes, les tailleurs de pierre, les orfèvres, les mineurs, les chirurgiens, les barbiers, les bergers, de sorte que les artisans („mechanici": ceux qui travaillent avec les mains!) les „praticiens de la géométrie", même s'ils ignorent la géométrie, en sont pourtant les disciples [47]). L'architecture, dit-il, n'est qu'une géométrie en pierres et en bois; tous les artisans mécaniciens sont des géomètres et la mécanique n'est que la pratique de la géométrie [48]). La géométrie n'est pas inutile à la vie humaine; au contraire, la vie humaine serait misérable sans les mathématiques et ceux d'entre les hommes qui cultivent et protègent l'étude de la géométrie sont aimés par Dieu et proches de Lui [49]).

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[42] Baron, l. c.

[43] Cf. E. W. Strong, o.c. p. 65; p. 260, n. 18.

[44] „. . . honoratum illud fortunatumque regiarum rationum collegium considerato, curiaeque abacos et calculos introspicito".

[45] Schol. math. p. 52, et aussi: Act. math. sec. (1566), Collect. p. 536—538.

[46] Schol. math. l. II, p. 53.

Ramus continue ensuite à énumérer les applications de la géométrie dans l'exploitation des mines: les mines fonctionnent grâce à des machines géométriques. L'art militaire est basé aussi sur la mécanique; Platon dit même que la fortification est de la géométrie et que le succès dans la guerre dépend des connaissances géométriques du chef [50]). Ramus simplifie trop les rapports historiques entre la technique et la science pure quand il affirme qu'après que les arts mathématiques furent introduits à Vienne, il y a 180 ans, par Henri de Hesse, les Allemands ont découvert trois arts admirables: la mécanique des bombardes [51]), appliquée pour la première fois pendant la guerre de Venise et de Gênes en 1400, — la typographie, qui fut inventée également grâce aux mathématiques et dont le premier produit parut à Mayence en 1466, — et la nautique, qui a pris un tel essor en Italie, sous l'influence des mathématiciens et des astronomes de l'Allemagne, que Colomb et Vespucci ont pu ouvrir la voie par les océans à tous les Aristippe et Épicure [52]). Les Aristippe et les Épicure, qui jugent les mathématiques inutiles ne seraient certainement pas écoutés en Allemagne et ils seraient chassés à coups de fouet des chaires académiques: l'Allemagne e eu ses Boniface autrefois, mais aujourd'hui on n'y en trouve plus[53]).

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[47]) Schol. math. l. II, p. 54—59.

[48]) Act. sec. math.: Collect. p. 539.

[49]) Schol. math. l. II, p. 59.

[50]) Schol. math. II, p. 60.

[51]) „bombardica seu tormentorum bellicorum mechanica".

[52]) Ramus considère, évidemment, les mathématiciens de l'Italie comme dépendant de ceux de l'Allemagne. Au XVme siècle, Aeneas Sylvius, le futur pape Pie II, juge les Allemands les meilleurs architectes et de grands mathématiciens: „Sunt meo judicio Teutonici mirabiles mathematici, omnesque gentes in architectura superant". Cf. S. Günther, Geschichte des mathematischen Unterrichts im deutschen Mittelalter, Berlin 1887, p. 228.

Tout ceci prouve que Ramus ne partageait pas du tout le mépris que l'humanisme littéraire et ses modèles de l'Antiquité (Platon, Archimède, Sénèque) affichaient à l'égard de l'empirie et des travaux manuels et qu'il n'admettait pas non plus, comme certains autres auteurs classiques („Quintilien", Épicure, Aristippe), que les mathématiques n'avaient aucune utilité pour la vie commune. Ses visites aux marchés de Paris et aux artisans de Nuremberg l'ont confirmé dans son opinion que même les auteurs les plus estimés de l'Antiquité s'étaient trompés à cet égard.

B. *La restauration du quadrivium*

Exception faite pour Mélanchthon, personne n'a été au XVIe siècle un avocat si zélé de la restauration des disciplines du quadrivium dans l'enseignement universitaire que Ramus. L'étude des arts se limitait pratiquement au trivium et, sous l'influence de l'humanisme, à l'éloquence et aux langues classiques. Beaucoup d'universités négligeaient les mathématiques. Il y avait des exceptions favorables (Vienne, Cracovie), mais à Paris Lefèvre d'Étaples constata en 1534 l'absence de l'enseignement mathématique[54]). La nomination du premier professeur royal de mathématiques, Oronce Finée, en 1531, ne signifia pas le rétablissement du quadrivium dans les études pour l'examen de maître-ès-arts.

Pourtant, le besoin d'une formation mathématique se fit cruellement sentir, notamment pour les commerçants et les architectes. Mélanchthon écrivit en 1549 à son ami, l'imprimeur Johannes Petreius de Nuremberg, que les mathématiques étaient peu étudiées en France, et que, par conséquent, quelques-uns de ses élèves gagnèrent leur vie en donnant des leçons de mathématiques dans ce pays[55]).

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[53]) S. Boniface, qui s'efforça de faire condammer Vergile (710—784), à cause de la doctrine des antipodes, était aux yeux des astronomes des XVIe et XVIIe siècles le modèle abhorré du théologien et du scolastique borné.

[54]) Günther, o. c. p. 226. Cracovie avait une chaire de mathématiques à la fin du 14e siècle (Günther, o. c. p. 229); Bologne possédait deux chaires depuis la fin du 15e siècle, l'une pour l'astronomie, l'autre pour l'arithmétique et la géométrie (Günther, o. c. p. 221); Vienne obtint deux chaires vers 1501 (Günther, o. c p. 253—254).

[55]) „In Gallia non tanta sunt studia Mathematum. Imo aliqui ex nostris Auditoribus, in Gallia docentes Mathemata, hoc labore se sustentarunt". CR VII.

À cette époque l'état d'infériorité dans lequel se trouvait à cet égard la France vis-à-vis de l'Allemagne et de l'Italie était telle que, d'après Forcadel, les Français étaient obligés „de mendier les ouvrages des Allemands et des Italiens" et c'est pour cela qu'il écrivit son „Arithmétique" [56]) et qu'il se sentit obligé ensuite d'écrire une Arithmétique „par les jetons" (le calcul le plus usité alors en France, pendant que les négociants et les banquiers „Lombards" s'étaient familiarisés depuis longtemps avec toutes les règles arithmétiques dont nous disposons aujourd'hui).

Dans ses Scholae Mathematicae Ramus fait le bilan de l'enseignement mathématique dans les divers pays de l'Europe. Il se fit mettre au courant par ses amis, ses élèves, qui rentrèrent de l'étranger, par ses visiteurs et ses correspondants. Si des amis ou des élèves revenaient d'Italie, il se renseignait sur les académies, les professeurs, les programmes et les méthodes d'enseignement [57]). D'autres élèves lui parlaient des universités de l'Allemagne et de la Pologne [58]); il demanda des renseignements à John Dee sur les professeurs et l'éducation mathématique aux universités d'Angleterre [59]).

Tandis que Platon et Pythagore faisaient des mathématiques le fondement de leurs écoles, l'on peut devenir maître-ès-arts chez nous, dit Ramus, avec deux années de logique et une année de physique, sans connaître les mathématiques [60]). Il se plaint parce que les mathématiques ne soient pas honorées et ne tiennent aucune place dans les statuts universitaires de Paris [61]). L'académie excelle en grammaire, rhétorique et en latin, grec et hébreu, mais les mathématiques sont à peine enseignées [62]) et n'occupent pas la place qui leur convient, et que Platon et Pythagore souhaiteraient. C'est pourquoi Ramus fait appel aux princes et magistrats de l'Europe et leur demande de rétablir l'enseignement mathématique. Il est d'avis que chaque université doit posséder au moins deux chaires de mathématiques, la charge étant trop pesante pour un seul professeur: une pour l'arithmétique, la musique, la géométrie, et l'optique, et une autre pour les sciences

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Epist. 4639, col. 514. Lettre de Mélanchthon „Iohanni Petreio civi ac Typographi Noribergensi, amico suo colendo", 16 déc. 1549.

[56]) J. Fontès, Mém. Ac. Sc. Toulouse, 9me série, T. VI (1894), p. 287.

[57]) Scholae physicae praef.; Collect. p. 75.

[58]) Schol. math. lib. I-III, passim.

[59]) Lettre du 14 Cal. 1565; Collect. p. 205.

[60]) Schol. math. I, p. 12

[61]) Prooem. ref. acad. Par.; Collect. p. 476.

[62]) Schol. math. l. I, p. 12.

astronomiques et la géographie [63]. Aux matières à enseigner par celui qui occupe la première chaire il ajoute encore la géodésie et la mécanique [64]. Il implore Élisabeth de fonder des chaires royales de mathématiques à ses universités d'Oxford et de Cambridge, une pour l'arithmétique, la musique et la géométrie (et jointes à celles-ci: la géodésie, l'optique et la mécanique), l'autre pour l'astronomie et la géographie [65].

Il fait appel au chancelier William Cecil et à ses correspondants John Dee et Jacobus Acontius pour qu'ils soutiennent ces vœux.

Pour l'Écosse, il rappelle à son ancien disciple, James Stuart [66], le frère de la reine, et au grand savant et poète Georges Buchanan leur devoir de persuader la reine de fonder des chaires royales de mathématiques [67].

Quant à l'Allemagne: comme Platon a incité par son éloquence aux études mathématiques en Grèce, Mélanchthon (qui est à cet égard le Platon allemand), trouva les mathématiques bien enseignées dans plusieurs universités allemandes, mais non pas à Wittenberg, et pour cette raison il s'était efforcé d'y faire fleurir les mathématiques: Millich, Reinhold et Peucer témoignent du résultat [68]. Ramus énumère les célèbres mathématiciens et astronomes des universités de l'empire: Gemma Frisius (Louvain), Petrus Apianus (Ingolstadt), Stofler (Tubingue), Sébastien Munster et Vurstitius (Bâle), Oswald Schreckenfuchs (Fribourg), Tagaud (Genève), Homelius et Rheticus (Leipsic), Herlinus et Dasypodius (Strasbourg) et une multitude d'autres [69].

Il croit, avec Léovitius, que le siècle d'or de la religion pure („purioris religionis aureum seculum") sera également un siècle d'or des arts, qui étaient presque dans l'obscurité jusqu'aujourd'hui [70]. Il reconnaît l'existence d'une correspondance étroite entre l'esprit de la Réforme et la renaissance des sciences et des lettres. Dans son discours „Basilea", il remarque que la terre bâloise, si fertile en talents de toutes sortes, n'avait cependant rien produit avant l'arrivée de l'Évangile, mais qu'avec la religion réformée on y avait vu jaillir aussitôt l'esprit et la science [71]).

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[63] Schol. math. l. II, p. 67.
[64] Schol. math. l. I, p. 14.
[65] L'optique, sous le nom de ‚Perspective" avait déjà fait son apparition dans les programmes de plusieurs universités médiévales.
[66] Cf. Waddington o.c. pp. 130, 396.
[67] Schol. math. l. I, p. 14.
[68] Schol. math. lib. II, p. 63.
[69] Schol. math. II, pp. 60—63.
[70] o.c. p. 63.

À Zurich l'étude des langues et de la théologie sont en plein essor, mais les mathématiques sont absentes du programme [72]); Heidelberg a introduit les études mathématiques un peu plus tard que les autres écoles allemandes, et il y a encore quelque opposition contre les mathématiques dans cette académie. Un seul professeur pour le quadrivium: l'arithmétique, la géométrie, l'optique, l'astronomie et la cosmographie, ne suffit pas; il faut le faire assister par un second. Ramus espère que le fils du Comte Palatin, Christophe, qui s'intéresse tant aux études, plaidera auprès de son père [73]).

Il est étrange que le centre célèbre de l'humanisme, Bâle, est à peine mentionné dans les Scholae Mathematicae. Après la visite qu'il rendit à cette ville en 1568—'69, Ramus répara cette faute et il en écrivit l'éloge, intitulé „Basilea" [74]), ouvrage dans lequel il témoigna de son enthousiasme pour cette ville de théologiens (Oecolampadius; Calvin), de philologues (Érasme, Castellion), de médecins (Vésale, Paracelse, Jean Bauhin), de mathématiciens (Simon Grynée, Sébastien Munster) et d'imprimeurs (Froben, Hervagius, Oporin, Episcopius). Pendant son séjour à Bâle, Ramus y fit imprimer plusieurs ouvrages mathématiques.

Quoiqu'il soit très satisfait de la situation de l'enseignement mathématique dans les universités allemandes, Ramus constate qu'il y en a trop qui n'ont qu'un seul professeur, tandis qu'il faut en avoir au moins deux [75]) et il fait appel à Camerarius pour continuer l'activité animatrice de Mélanchthon et à Sturmius pour établir une deuxième chaire de mathématiques à la nouvelle université de Strasbourg [76]). Évidemment, la situation à Vienne, où l'empereur humaniste Maximilien avait fondé deux chaires de mathématiques, était pour Ramus (comme pour plusieurs humanistes allemands), un exemple éclatant.

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[71]) Il cite les réformateurs qui avaient vécu à Bâle: Oecolampadius, la lampe de la religion pure, „le prophète que Dieu vous a suscité pour vous conduire à la connaissance de son évangile", homme de grand savoir et de singulière modération, qui avait procuré „la liberté chrétienne" aux Bâlois (Ramus, „Basilea" 1571, p. 28—29), et l'hôte de l'académie le plus important aux yeux de Ramus, Jean Calvin, „cette lumière de la France ou plutôt de l'Église chrétienne universelle", qui avait écrit l'Institution chrétienne quand il était logé chez Cathérine Petit, qui avait été aussi l'hôtesse de Ramus en 1569 (Basilea, p. 32).

[72]) Schol. math. II, p. 64.

[73]) o.c. p. 65.

[74]) P. Ramus, Basilea ad senatum populumque Basiliensem. 1571.

[75]) o.c. p. 67.

[76]) o.c. p. 68.

Ramus est d'avis que si les académies de la France imitaient l'Allemagne en fondant des chaires de mathématiques, les riches mines métallifères de la France porteraient fruit de nouveau. Mais en France on s'occupe trop de la philosophie péripatétique et du droit civil, bien que nous ayons démontré par l'exemple de Pythagore, Platon et Aristote que personne ne peut être physicien ou politicien sans connaître les mathématiques et que les juristes eux-mêmes ont besoin de ces disciplines [77]).

L'Italie met Ramus en embarras. C'est un pays où les applications de l'arithmétique dans le commerce, et de la géométrie en architecture, en mécanique, en optique, et en peinture sont manifestes, plus qu'en aucun autre pays; les banquiers italiens, ainsi que les mécaniciens, les architectes civils ou militaires, et les peintres sont les plus capables et les plus célèbres dans le monde entier, mais pour une raison inconnue, les études mathématiques y ont commencé à être désaffectées et les professions mathématiques à être moins à l'honneur; ses universités nombreuses excellent en langues classiques, en rhétorique, en logique, en physique, en médecine et en droit, mais les mathématiques y sont peu en estime. Dans les académies italiennes on ne trouve pas de professeurs dignes de l'Italie et les salaires et les honneurs qu'ils reçoivent valent autant. Ceux qui écrivent sur les mathématiques ne sont pas d'hommes du métier: ils le font pour se détendre et pour s'exercer l'esprit. Cardan fut médecin, Maurolycus, qui publia les œuvres des anciens mathématiciens, Piccolomini, qui commenta la Mécanique d'Aristote, le noble Vénétien Barocius, qui édita Proclus [78]), Daniel Barbarus, qui expliqua Vitruve [79]), n'étaient pas des mathématiciens professionnels. Commandino, qui traduisit Archimède, Apollonius, et Ptolémée, n'occupe pas de chaire. Les Italiens ont aimé les arts mathématiques afin de s'en occuper dans leurs loisirs et pour l'usage domestique ou militaire, mais ils n'ont ni de nombreuses et célèbres chaires professorales ni d'écoles de mathématiques. Et c'est pour cela que Ramus veut pousser les princes et les cités libres à prendre soin que les mathématiques ne soient plus exclusivement cultivées à titre particulier, mais que des chaires soient fondées dans les académies publiques [80]). Il mentionne le duc Emmanuel, qui à grands frais a attiré des savants à l'académie de Turin, et qui s'intéresse aux arts et a fait faire des instruments précieux, et il l'invite à patronner également les mathématiques.

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[77]) o.c. p. 68—69.

[78]) Procli Diadochi in primum Euclidis elementorum librum commentariorum libri IV a Francisco Barotio editi. Patavii 1560.

[79]) I dieci libri dell'architettura traducti et commentati da Monsignor [Daniello] Barbaro. Venet. 1556. Barozzi et Barbaro étaient des patriciens de Venise.

[80]) Schol. math. pp. 101—102.

Mais surtout Venise doit être exhortée plutôt que louée. Les patriciens de Venise sont des amateurs de mathématiques; les artisans vénétiens sont célèbres et l'Arsenal de Venise présente un exposé complet de tous les usages possibles de la géométrie. Et les artisans de Venise, bien qu'ignorant les lettres latines et grecques, sont si experts dans l'usage de l'arithmétique et de la géométrie, qu'ils écrivent, comme Tartaglia, les livres les plus subtils sur ces sujets. Mais à l'université de Padoue où les Vénétiens ont des professeurs très célèbres d'éloquence, de philosophie, de médecine, et de droit, ils n'en ont pas pour les mathématiques et l'astronomie [81]).

Et enfin Bologne, la plus célèbre des universités de l'Italie, où Maria Novara, le précepteur de Copernic, a enseigné, et où l'on a choisi Ramus pour professeur, devrait donner plus d'ampleur à l'enseignement mathématique [82]).

La rudesse des Russes est mise en contraste avec le goût des Turcs pour les mathématiques [83]). Ramus éprouve encore moins de satisfaction de l'Espagne; il rappelle au roi Philippe qu'il règne sur tant de pays avec tant d'universités qu'il pourrait posséder plus de mathématiciens qu'aucun autre prince. Enfin il rappelle au Pape que l'exercice des arts mathématiques aurait pour conséquence un approfondissement de la piété et contribuerait à protéger ceux qui les étudient contre les fables superstitieuses et il lui conseille d'écarter de lui les Aristippe en pourpre [84]).

Ainsi Ramus a exhorté l'Angleterre, loué l'Allemagne, exhorté et loué à la fois l'Italie [85]). Évidemment en Italie l'averroïsme et l'humanisme des universités furent peu favorables aux mathématiques et encore moins aux mathématiques „pratiques", et ceci en dépit du grand intérêt pour les mathématiques théoriques de beaucoup d'érudits et de l'intérêt général des artisans et ingénieurs pour les mathématiques pratiques. En Allemagne, par contre, il remarqua une harmonie plus parfaite: l'intérêt général des artisans, des bourgeois et des princes pour les mathématiques théoriques ainsi que pratiques, se refléta dans la situation assez satisfaisante de l'enseignement académique.

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[81]) Cela ne veut pas dire que les mathématiques ne fussent pas enseignées du tout: dans la faculté des arts de l'université médiévale des maîtres furent désignés à „lire" Euclide, ou Alhazen, etc., quoiqu'ils ne fussent pas spécialisés dans ces arts. Ramus désire, par contre, des professeurs permanents et spécialisés en mathématiques, comme on ne les trouvait alors que rarement.

[82]) o.c. p. 101—103.

[83]) o.c. p. 67.

[84]) Schol. math. p. 101—104.

[85]) Schol. math. l. III, p. 101.

En général, l'humanisme allemand était peut-être moins exclusif que le mouvement analogue en Italie. Et l'on peut comprendre que Ramus caractérisa l'Allemagne comme „la nourrice des mathématiques" [86]), où les sciences appliquées avaient atteint la plus haute perfection et d'où il attendit la réforme de l'astronomie.

Cet enthousiasme, fondé sur des renseignements privés et sur la lecture d'ouvrages écrits par des Allemands, a encore augmenté lors de sa visite en Allemagne de 1568 à 1570; il appela alors ce pays „le saint asyle des mathématiques" [87]) et le considéra désormais comme sa seconde patrie [88]).

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[86]) Scholae physicae praef.; Collect. p. 74.

[87]) Mathem. praef. quarta; Collect. p. 190.

[88]) Ibid. p. 191.

XI

RAMUS ET LA TRADITION EMPIRISTE

A. *Les artisans et l'expérimentation.* — La tradition conservatrice des scolastiques et la tradition des artisans et techniciens. — Palissy; les Nurembergeois. — B. *Ramus et les artisans.* — Le contact de Ramus avec les marchands et les ouvriers. — Forcadel. — Éloge des artisans, spécialement de ceux de Nuremberg. — Jamitzer et Lencker. — Les sciences appliquées en Allemagne. — C. *Explication de la floraison des mathématiques en Allemagne par Ramus.*

A. *Les artisans et l'expérimentation*

La science expérimentale du seizième siècle prend ses racines dans deux traditions: la tradition de la philosophie rationnelle, héritage des Grecs, et la tradition ininterrompue des artisans, des alchimistes et des ingénieurs. L'union de ces deux traditions, la pénétration des méthodes rationelles dans les travaux des artisans, ainsi que la pénétration des résultats de l'expérimentation dans la philosophie de la nature, s'effectua surtout au seizième siècle. La fécondation des sciences théoriques par les arts pratiques est au début peut-être plus considérable que le développement des techniques sous l'influence des sciences. La science médiévale disputait toujours les mêmes problèmes; elle avait acquis une grande subtilité par le raffinement des notions, en introduisant des distinctions et en résolvant des questions subtiles, mais elle avait perdu le contact avec la nature réelle. Vivès ne fait qu'exprimer un sentiment assez répandu quand il dit que les calculs des Suiseth „ne s'appliquent ni à la science, ni à aucun usage pratique", et que les scolastiques „ne discutent que des cas qui ne se produisent jamais, qui ne peuvent même pas se présenter dans la nature".

Les scolastiques traitent toujours les mêmes questions traditionnelles. Mais, dès que le contact de la philosophie et de la science théorique avec la réalité est rétabli, de nouveaux problèmes surgissent immédiatement, des problèmes posés par l'expérience naïve, par la pratique de la vie commune. En même temps de nouvelles réponses apparaissent, des réponses suggérées par cette même expérience. Les techniques, tant développées pendant le Moyen Âge (p. e. les moulins à vent et à eau, parallèlement aux industries métallurgiques; la technique militaire, l'invention de la poudre à canon) posent de nouveaux problèmes. La mécanique médiévale fournit par exemple des discussions raffinées au sujet du mouvement des projectiles et au sujet de la chute, mais elle négligeait traditionnellement l'important problème du choc. Ce n'est qu'au XVIe siècle que les techniciens entament la discussion scientifique de ce phénomène. Ainsi la science va emprunter ses problèmes et leur solution en grande partie à la technique (machines, fortifications, peinture) et ainsi c'est à ceux qui, abandonnant les préjugés des scolastiques et des humanistes, rétablissent le contact entre la science et la pratique, que nous devons en grande partie la renaissance des sciences depuis le XVIe siècle.

Des ingénieurs et des artisans intelligents découvrent leur propre valeur et importance dans le domaine de l'exploration du monde; même l'agriculture, si méprisée, trouve son défenseur dans la personne du potier Bernard Palissy, qui maintient qu'il n'y a nul art dans lequel plus de philosophie soit requise qu'en agriculture, „qui est un juste labeur et digne d'estre prisé et honoré" [1]). Nuremberg surtout, était un centre où une bourgeoisie à peine sortie de l'état de l'artisanat, se livrait aux études scientifiques et humanistes et où il y avait une collaboration intime entre les savants humanistes et les artisans cultivés. Johann Werner, qui devait devenir un des premiers pasteurs de la nouvelle église, traduisit, à l'instigation du magistrat et humaniste Willibald Pirckheimer, les Éléments d'Euclide en langue vulgaire pour le fils du fondeur d'acier Sebald Beheim. L'orfèvre et peintre Albrecht Dürer appartenait aussi au cercle de Pirckheimer; il s'occupait de l'optique et de la fortification. L'orfèvre Wentzel Jamitzer était un mathématicien accompli et auteur de livres géométriques. Déjà au siècle précédent, Regiomontanus s'était établi à Nuremberg à cause de la haute perfection de l'art des mécaniciens de cette ville, qui pussent lui faire des instruments en métaux et en bois d'une précision inouïe. Ramus raconte que le magistrat avait fondé une chaire publique en mathématiques; le professeur donnait non seulement des leçons en latin, mais aussi en langue vulgaire, afin que les artisans pussent en profiter [2]).

B. *Ramus et les artisans*

Ramus, l'usuaire qui croyait que les inventions mécaniques „sont dues pour une grande part aux mathématiciens", reconnaît que, d'autre part, les mathématiques se sont développées grâce aux arts mécaniques. Il est prêt à divulguer les secrets des arts libéraux aux artisans; il est également disposé à apprendre les secrets des arts mécaniques, dans lesquels les arts libéraux trouvent une application naturelle et souvent inconsciente. D'après ses vues sur le caractère des arts libéraux, la pratique des arts mécaniques doit fournir des données précieuses pour la restauration des arts libéraux. En même temps les arts libéraux restaurés produiront des fruits abondants pour l'usage, pour leur application dans les arts mécaniques.

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[1]) B. Palissy, Récepte véritable, La Rochelle 1564, „Au lecteur". Oeuvres éd. A. France, p. 20.

[2]) S. Günther (op. cit. p. 134) fait remarquer que nous n'avons aucune preuve de la justesse de cette assertion de Ramus. Quoiqu'il en soit, le magistrat, (guidé par les conseils de Mélanchthon), avait fondé en 1526 une école humaniste, et un des quatre professeurs, Johann Schoner, était chargé d'enseigner les mathématiques.

Ici Ramus se rencontre avec les artisans. En longeant la rue St Denis, il parle avec les marchands, qui ont développé par l'usage leurs méthodes arithmétiques à eux, et il est évident qu'il a inséré quelques-unes de leurs méthodes de calcul dans son ,,Arithmétique".

Un exemple encore plus frappant du respect que Ramus éprouve à l'égard de l'expérience, c'est qu'il se fit aider par Pierre Forcadel qu'il fit nommer plus tard lecteur royal. Forcadel enseignait en *français* l'arithmétique et la géométrie de 1560 à 1573, et Ramus nous dit qu'il était un homme ,,sans lettres", sans éducation scientifique, et qu'il ne fut mathématicien que grâce à son talent et à l'exercice. Avec une exagération d'humaniste il compare Forcadel au marchand Hippocrate, c'est à dire au grand Hippocrate de Chios, un marchand qui, ayant perdu toutes ses propriétés, vint à Athènes, y suivit les leçons des Pythagoriciens et devint un des plus célèbres mathématiciens de l'Antiquité [3]). Le fait qu'il a introduit un homme tel que Forcadel dans le milieu académique est une preuve que Ramus ne partageait pas tous les préjugés des humanistes.

En outre, on peut s'imaginer que Ramus n'a eu aucune objection contre des leçons de géométrie données en français, car l'enseignement des mathématiques devait être simplifié, surtout afin que les théoriciens et les praticiens pussent s'entre-aider et collaborer. Son idéal fut le mécanicien Héron d'Alexandrie, qui écrivit sur la géométrie, la géodésie, et les machines de guerre, et qui unit l'élégance géométrique d'un Platon à la mécanique d'un Archimède; qui unit habilement l'art à l',,usage'' de l'art [4]). Un vrai mathématicien, selon lui, n'est pas celui qui ne fait que tirer, des propositions arithmétiques et géométriques, des conclusions à l'aide des syllogismes, mais plutôt celui qui montre par son exemple et son habileté les bénéfices de l'arithmétique, l'utilité de la géométrie. Dès qu'il en sera ainsi il n'y aura plus seulement les doctes pour apprendre et cultiver facilement les éléments de mathématiques, comme c'est le cas aujourd'hui, mais aussi les enfants, les mécaniciens, les architectes, les peintres [5]).

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[3]) ,,(quod in mercatore Hippocrate mirum fuisse alibi scripsimus), P. Forcatelus ... sine literatura, sine philosophia, solo ingenio atque usu quodam mathematicus sesquiannum apud nos fuit". Puis la guerre civile éclata et après: ,,Forcatelo (cum alter mathematum professor defunctus esset) mathematicam professionem procurare: ut gallica saltem lingua gallicam juventutem exercendo regii collegii columnam istam qua posset, facultate tueretur" (Mathem. praef. quarta. Collect. p. 188—189). Sur Forcadel voyez Cantor, o.c. T. II, p. 549—550.

Cent ans plus tard, l'historien de la Société Royale de Londres, Thomas Sprat, devra encore émettre le même voeu.

Ramus put se vanter d'être en bons rapports avec tous les experts mathématiciens de l'académie de Paris, et, aussi, qu'il n'y avait à Paris nul artisan habile dont il n'eût pas souvent fouillé et fureté l'atelier mécanique [6]).

Aussi, lors de sa visite à Nuremberg, où l'artisanat avait atteint un haut degré de perfection, il profita de l'occasion pour se mettre en contact avec les plus insignes mécaniciens et fabricants d'instruments du monde. Accompagné de son élève allemand, Frédéric Reisner (qui écrira avec lui un livre d'Optique), il rendit visite à Wentzel Jamitzer et à Johann Lencker, deux célèbres orfèvres mécaniciens, dont le premier fut aussi l'auteur de livres mathématiques en langue vulgaire. Jamitzer et Lencker avaient construit un appareil optique mais qu'ils ne voulaient montrer à aucun prix à leurs visiteurs. Enfin Lencker se montra traitable à la condition que Reisner leur enseignât l'optique de Ramus. Ramus visita aussi les bibliothèques, l'arsénal et plusieurs mathématiciens de Nuremberg. Selon son biographe, Thomas Freigius, il était tellement satisfait de ce qu'il y avait vu, qu',,il ne demeura là que quatre jours, mais il eût voulu y demeurer quatre années'' [7]).

Déjà en 1567, donc avant sa visite, Ramus révéla son enthousiasme pour cette ville. Elle avait hébergé autrefois Regiomontanus, le plus grand des mathématiciens et des astronomes, mais tandis qu'à Tarente, à Syracuse, à Byzance et à Alexandrie, les mathématiques disparurent avec Archytas, Archimède, Proclus, et Ctésibe, à Nuremberg les Regiomontani n'ont jamais disparu. Les artisans de Nuremberg font encore des machines dignes d'un Archytas, car le Sénat et le peuple de Nuremberg ont fait de leur mieux pour avoir toujours des Regiomontani parmi eux: d'abord Werner, après lui les deux Schoner, père et fils. Ils ont fait une chose extraordinaire pour une ville: ils ont accordé des traitements à un professeur public, qui devait instruire non seulement les doctes et érudits, mais aussi, en langue vulgaire, les artisans ignorant le latin et le grec. Par conséquent, l'on trouve parmi ces derniers des mathématiciens accomplis, témoin le grand peintre Dürer, et les Nurembergeois prennent soin que si un des insignes artistes tombe dans la misère, il soit suffisamment aidé [8]).

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[4]) Schol. math. l. I, p. 33: ,,Quamobrem iste mihi imprimis placet author, qui Platonis Geometriam cum Archimedis mechanica, qui artem cum artis usu tam solerter atque industrie conjunxerit''.

[5]) Schol. math. l. III, pp. 106—107.

[6]) ,, . . . dico atque confirmo, nullum esse in Academia Paris. mathematicis artibus eruditum, quem non familiarem charumque habeam: imo opificem in urbe nullum paulo ingeniosiorem, cujus officinam mechanicamque totam non saepe perscruter atque excutiam''. Actio pro regia mathematicae professionis cathedra, habita in Senatu 3 Id. Martis anno 1566. Collect. p. 552.

[7]) Wadd. o.c. p. 210.

C. *Explication de la floraison des mathématiques en Allemagne*

Les mathématiques, dit Ramus, ne sont nulle part autant en honneur qu'en Allemagne. Aussi ne fleurissent-elles nulle part autant qu'en Allemagne, car, comme le dit Cicéron, l'honneur nourrit les arts [9]). Les Allemands qui viennent en France, ainsi que les Français qui sont allés en Allemagne, sont unanimes en leur opinion que l'Allemagne a le privilège de posséder des princes doctes et érudits, qui s'intéressent aux études mathématiques, comme le Landgrave Guillaume de Hesse qui fit construire un observatoire et des instruments astronomiques à Kassel. L'électeur Auguste de Saxe, incité par Homelius, lui a demandé de construire un planétaire analogue au sien [10]). Crato, le médecin de l'empereur, (par sa célébrité comme mathématicien) augmente la gloire mathématique de son maître [11]), dont l'aïeul, Maximilien, fonda et stipendia une chaire publique de mathématiques à l'académie de Vienne, exemple qui a été suivi par beaucoup de princes et de cités libres [12]).

Ensuite Ramus se demande: Quelle est donc la raison que, d'après le témoignage unanime de tous ceux qui ont étudié à l'étranger et sont retournés chez nous, nul pays n'a tant d'écoles munies de chaires mathématiques bien stipendiées par le gouvernement que l'Allemagne? [13] La réponse qu'il y trouve est d'ordre économique: c'est que la plupart des revenus des princes et des cités libres viennent du règne de Pluton, des mines d'or, d'argent et d'autres métaux, qui sont entretenues et révisées à l'aide de l'artifice géométrique d'innombrables machines. „C'est donc avec des mains géométriques que le Pluton allemand tire ses richesses du sol de l'Allemagne" 14). Deuxièmement, l'art militaire est tout à fait fondé sur la géométrie; les grandes inventions militaires sont allemandes, l'Allemagne invente et fabrique tous les jours de nouvelles armes et les distribue aux peuples voisins, „c'est donc la véritable école de Mars et l'officine de Vulcan" 15).

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[8]) Schol. math. p. 62.

[9]) „Honor igitur alit artes (ait Tullius) omnesque incenduntur ad studia gloria. Ergo mathesis in Germania praecipue effloruit". Schol. math. l. II, p. 62.

[10]) Schol. math. p. 64.

[11]) Schol. math. p. 64.

[12]) Schol. math. p. 62.
L'empereur Maximilien I, le héros des humanistes allemands, fonda un „Collegium poetarum et mathematicorum" (1502) avec des chaires de poésie, d'éloquence et de mathématiques. En outre il institua à l'université de Vienne, en dehors de l'enseignement de la faculté des arts, deux chaires ordinaires de mathématiques et d'astronomie (1503), et dorénavant bien des humanistes demanderont aussi *deux* chaires de mathématiques.

Car il y a rapport de réciprocité: la situation économique pousse les gouvernements à protéger les mathématiques et l'enseignement mathématique, mais là, où les écoles de mathématiques sont bonnes, les mathématiciens et, par conséquent, les militaires et les ingénieurs sont bons 16).

C'est une explication assez plausible, qui contient sans doute une part de vérité, bien que nous ne croyions pas qu'elle contienne toute la vérité. Ramus lui-même est embarrassé par l'Italie, où l'intérêt pour l'art militaire était très grand, où Venise, une ville de commerce et d'industrie, hébergeait toutes sortes d'artistes et d'artisans, où il y avait beaucoup de princes et de riches bourgeois qui s'occupaient assidûment des mathématiques, mais où, néanmoins, (comme il fait ressortir lui-même) l'enseignement public des mathématiques laissait beaucoup à désirer; on ne tenait pas les mathématiques en honneur et l'on payait moins les professeurs de mathématiques que les professeurs de médecine, de langues, etc. 17).

L'affaire est donc évidemment plus compliquée.

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13) Schol. math. l. II, p. 60.

14) „Ergo Germanicus ille Pluto geometricis manibus divitias suas Germaniae effodit atque eruit". Schol. math. l. II, p. 60.

15) „Haec vere Martis schola est: haec Vulcani officina est. Sed Martem, Vulcanumque, Martisque scholam et Vulcani officinam mathesis genuit, aluit, informavit". Schol. math. l. II, p. 61.

16) „. . . ubi mechanica militaris diligenter exculta fuerit, ibi etiam milites egregios fore". Schol. math. p. 61.

17) Cf. Schol. math. l. III, p. 101. En général les leçons universitaires de mathématiques étaient mal payées au Moyen Âge et au XVIme siècle.

XII

LA SCIENCE, L'ÉCONOMIE ET LA RELIGION

C'est ici que nous touchons au problème épineux qui a tant occupé les historiens depuis A. de Candolle, E. Troeltsch, et Max Weber, à savoir le problème des influences respectives de la religion et de l'économie sur le développement et l'appréciation des sciences. Est-ce la théologie (et spécialement: la théologie réformée) qui a stimulé, ou du moins favorisé, l'essor de la technique et des sciences naturelles, soit directement, soit indirectement, c.-à.-d. en inspirant l'esprit du capitalisme? Ou est-ce le développement économique et social qui a entraîné avec lui comme conséquence naturelle l'intérêt scientifique aussi bien que la théologie réformée?

Il semble qu'une réponse nette est impossible, ou du moins prématurée, puisque ces facteurs sont entrelacés. Les pays libéraux ont été souvent les pays où l'on avait un contact intense avec l'étranger, où la vie culturelle était variée, où le commerce et l'industrie fleurissaient, où la bourgeoisie ou l'artisanat prenaient essor, et où, par conséquent, l'élasticité de l'esprit était grande. C'est là que l'on trouvera des conditions favorables à l'indépendance religieuse et à la culture des sciences et des techniques. Les centres d'activité de la nouvelle religion sont souvent en même temps les lieux du contact entre la technique et les sciences théoriques: au XVIe siècle ces contacts ne se produisaient pas en premier lieu dans les universités, mais dans les villes de commerce: Venise, Nuremberg, Anvers, Londres. Une république comme Venise, quoique catholique, fut à l'origine assez libérale en matière de religion et, en même temps, une ville commerciale et industrielle dans laquelle les techniques et les sciences florissaient. Aux Pays-Bas, Anvers qui était avec Gand le centre du commerce et la ville des imprimeurs et des savants, fut en même temps un centre du protestantisme. En Angleterre, Londres, ville de marchands, est le foyer d'un protestantisme radical, du puritanisme, et en même temps la science nouvelle se concentre plutôt là qu'autour des universités. En Allemagne, Nuremberg et Augsbourg étaient des villes où le protestantisme prit pied de bonne heure, et qui avaient un gouvernement républicain, une industrie florissante, une riche vie intellectuelle et scientifique.

C'était toujours surtout l'avant-garde qui propageait les nouvelles idées sociales, la nouvelle religion, et la nouvelle science. Peut-être pourrait-on dire: la même attitude d'esprit qui rendit une population mûre pour accepter la Réforme, lui permit d'abandonner plus facilement des traditions philosophiques surannées et la prédisposa à embrasser la nouvelle science.

Pourtant, la recherche scientifique une fois établie, il était encore nécessaire que la théologie la regardât avec bienveillance ou, du moins, ne montrât aucune hostilité contre elle, afin qu'elle pût se développer sans gêne. Or, il y a des preuves convaincantes [1]) que les protestants ont pris une part plus active au développement de la science moderne que leur nombre ne permettrait de supposer. Mais on n'est pas si vite d'accord sur les causes de ce phénomène remarquable. Il y a aussi les influences personnelles, la constellation politique, la tradition nationale, la situation économique, la vie sociale, qui déterminent chacune pour sa part l'intérêt scientifique. Par suite de causes qu'il n'est pas notre devoir d'analyser, une nouvelle classe sociale surgit et en même temps des changements profonds en économie et en religion avaient lieu. Il est difficile de déterminer la part exacte des facteurs respectifs comme moteurs du mouvement scientifique. Quoi qu'il en soit, la question prochaine sera: quelle influence la science et la religion, ont-elles exercé l'une sur l'autre? Même si la raison principale de l'intérêt scientifique était d'ordre économique, resterait encore le problème de savoir si la science et la religion se sont entr'aidées ou si elles se sont opposées l'une à l'autre. Et, s'il y a influence favorable de la religion sur la science, quelles doctrines ou pratiques chrétiennes ont été en particulier favorables aux sciences, et dans quels groupes ces doctrines ou pratiques ont-elles été accentuées le plus?

Si l'on n'accepte pas les interprétations générales de l'histoire, inspirées par un dogmatisme quelconque, on se refusera à donner une réponse absolument générale qui n'admet pas d'exceptions considérables, et l'on fera dépendre des faits son „explication" des faits. Ici encore, c'est Ramus, le philosophe et pédagogue, qui se montre aussi bon historien et ici encore on ne peut qu'admirer la largeur de ses vues. Ses interprétations historiques ne proviennent pas d'un absolutisme dogmatique. Il attribue l'intérêt pour les sciences en Allemagne principalement à des facteurs économiques, mais il ne généralise pas et reconnaît que cette explication ne suffit pas pour l'Italie, pays où, à Venise une situation analogue à celle de Nuremberg, selon lui, est accompagnée d'effets totalement différents. Et, ce qui est plus remarquable encore, il voit dans l'intérêt scientifique à Bâle l'influence fécondante de la Réforme et de la tolérance qui règne dans cette ville. En outre, il s'attend de même à ce que la restauration de la ,,religion pure'' contribue à la floraison des sciences en Allemagne.

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[1]) Cf. R. Hooykaas, „Science and Reformation", Cahiers d'Histoire Mondiale 3 (1956), pp. 109—139; 3 (1957), pp. 781—784.

Peut-être l'influence la plus puissante a été celle qu'exercent l'amour de la liberté, l'indépendance de l'esprit, qui favorisent le développement économique et social aussi bien que les réformes religieuses; il est donc difficile d'établir nettement la part due à chacune de celles-ci dans la floraison des sciences.

Dans le cas de Ramus lui-même on ne voit pas qu'il y eût des influences *économiques* ou sociales qui l'eussent poussé vers les sciences appliquées. Quant aux influences religieuses, elles sont plus considérables. Bien sûr, son intérêt pour les arts et, en effet, tout son programme, existait déjà avant sa conversion au protestantisme. Mais cette conversion n'était pas du tout la conséquence d'une crise religieuse, mais le dernier pas d'une évolution graduelle. Ses collègues, les professeurs royaux, étaient en majorité des protestants ou penchaient du côté de la Réforme. Ceux qui ont influencé Ramus sont considérés comme des sympathisants (Lefèvre d'Étaples) [2]) ou des adhérents de la Réforme (Sturmius). Les adversaires de Ramus appartenaient à la partie conservatrice; c'étaient des scolastiques et les jésuites, les ennemis de la liberté spirituelle [3]).

Or, Ramus, au contraire, comme Luther, même avant sa rupture avec l'église romaine, était d'un tempérament religieux qui le prédisposait au protestantisme. Et parmi les protestants il représente un type radical et progressif. Son protestantisme sort du domaine pur de la théologie, c'est plus qu'un catholicisme révisé sur quelques points de doctrine et de pratique, c'est une nouvelle attitude d'esprit, qui pénètre dans tous les recoins de la vie privée et publique et qui, par conséquent, mène aussi à une réforme des sciences et de l'enseignement.

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[2]) Cf. Waddington o.c. p. 128—129.

[3]) Il y avait aussi des catholiques romains qui continuèrent à prendre le parti de Ramus. En 1564 son disciple Arnaud d'Ossat (le futur cardinal) prit sa défense contre Jacques Charpentier (qui sera responsable de la mort de Ramus), dans l',,Expositio Arnaldi Ossati in disputationem Jacobi Carpentarii de methodo . . .'' Jean de Montluc, évêque de Valence, homme très tolérant, dont plusieurs ouvrages furent mis à l'Index (cf. Wadd. o.c. p. 250), protégeait lui aussi Ramus et lui marquait plusieurs fois sa bienveillance.

XIII

RAMUS ET BACON

Les analogies et les différences de Ramus et Bacon. — Les explications qu'ils donnent du déclin des sciences. — Simon Grynée, Bacon et Ramus: la chute de l'homme et la raison.

Ramus et Bacon sont tous les deux des ,,utilitaires'' acharnés; les deux veulent une réforme de l'enseignement qui devra mettre l'accent sur les applications des sciences dans la vie commune. Ni l'un ni l'autre n'a contribué en rien de concret à la science: aucune découverte, aucune expérience, aucune théorie scientifique n'est liée à leurs noms. Ils ont assigné un nouveau but à la science et c'est plutôt leur talent d'écrivain, leur capacité de synthèse que l'originalité profonde de leur pensée qui explique leur succès éclatant. Plutôt que des pionniers, ce sont les représentants de l'union des courants convergents parmi les savants et les artisans, et les moteurs du mouvement puissant qui y a pris sa source. Ils ont voulu doter la science d'une nouvelle logique inductive, mais — à part un grand nombre d'idées bonnes pour la pratique — leurs *systèmes* n'ont pas été suivis, n'ont pas trouvé d'application dans l'œuvre *scientifique*, même de leurs disciples enthousiastes [1]).

La religion chrétienne est une force qui leur inspire leur méthode empirique; la liberté philosophique qu'ils proclament provient de la liberté chrétienne qu'ils confessent. D'autre part, du point de vue méthodologique, tous les deux se sont refusés à mêler la théologie à la philosophie et à la science.

Mais, du reste, quelle différence! L'intérêt que Ramus porte aux arts mécaniques diffère profondément de l'empirisme baconien. Ramus ne commence pas ses activités par une *histoire naturelle générale*, par une collection de faits naturels, mais il insiste surtout sur une ,,histoire'' (un inventaire) de l'application des arts libéraux. Par conséquent, tandis que Bacon proclame la recherche inductive de la nature, Ramus ne vise pas en dernière analyse la découverte de la nature, mais la restauration des arts. Sans doute, il y a des points communs. Bacon désire lui aussi la restauration des arts et il considère une *histoire des arts mécaniques* comme très utile à la restauration de la domination de l'homme sur la nature. Mais plus que Ramus il sort du cadre de l'enseignement de la faculté des arts; il est moins l'homme d'université et davantage l'homme de la société que Ramus.

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[1]) Le jugement des 19me et 20me siècles sur la dialectique ou la logique de Ramus ainsi que sur les méthodes d'induction de Bacon, n'est pas très favorable. La logique de Ramus n'est pas meilleure que celle d'Aristote; ce qui en est bon est fondamentalement aristotélicien. Dans cette étude-ci nous n'entrons point dans cette question; ce qui nous intéresse ici c'est l'influence de Ramus sur le développement de l'empirisme scientifique.

Ramus, comme Mélanchthon, Venatorius et d'autres défenseurs académiques des arts du quadrivium et de leur utilité aux arts mécaniques, se limite aux arts libéraux qui, bien que négligés, étaient traditionnellement liés à la faculté des arts, et c'est déjà beaucoup qu'il veut étendre l'enseignement de ces arts à leurs annexes: la géodésie, la mécanique et l'optique [2]). Il marque moins d'intérêt pour les sciences de classification; il n'a pas traité la botanique, la zoologie et la médecine („l'art de guérir"), quoiqu'il voulût qu'on fondât des chaires de botanique, d'anatomie, de pharmacie et, en outre, qu'on établît un enseignement pratique (suivant la théorie d'Hippocrate et Galien) dans la faculté de médecine [3]). Quant à la chimie, science qui n'avait à l'époque nulle part accueil dans les universités, n'ayant même pas pénétré dans la faculté de médecine, elle tomba absolument hors du domaine de ses intérêts.

Bacon, par contre, comme Paracelse, reconnut l'importance primordiale de la chimie et lui aurait réservé volontiers une place d'honneur dans l'enseignement supérieur. Pour Bacon la chimie joue un rôle important dans la restauration des sciences et de la domination sur la nature. Car Bacon veut *diriger* la nature, il veut la conquérir, lui arracher ses secrets par les „vexations de l'art", (c'est-à-dire: par *des expériences*). Ramus ne se soucie guère des expériences; sa „physique" est encore largement basée sur le raisonnement, ou, tout au plus, sur l'observation, mais à peine sur une expérimentation délibérée.

S'il y a une grande distance de l'humanisme original et purement littéraire (qui professe son dédain à l'égard des sciences de la nature et des arts manuels) à un humanisme qui s'intéresse à la *plénitude* de la culture ancienne et qui veut même la surpasser, il y a aussi une grande distance de ce dernier à l'empirisme et à l'esprit d'expérimentation qui caractérisent la science moderne. On pourrait dire peut-être que ces humanistes du second type s'intéressent aux manifestations de l'esprit humain, plutôt qu'à un examen empirique de la nature. L'empirisme raméen va déjà plus loin, en ce qu'il compte les manipulations des artisans parmi les manifestations de l'esprit, tandis que l'empirisme baconien est encore plus moderne par l'intérêt qu'il manifeste pour tous les domaines de la nature et surtout par sa soumission aux données de la Nature en dehors de l'homme.

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[2]) L'optique avait déjà fréquemment figuré au programme de l'enseignement des arts aux universités médiévales, tandis que la discussion des problèmes de mécanique théorique n'y manquait pas non plus absolument.

[3]) Prooem. reform. Paris. Acad.; Collect. pp. 486—489.

Pour Bacon la raison doit s'humilier devant la Nature, qui est l'œuvre de Dieu; Ramus accentue plutôt la restauration de la raison *naturelle* en sa fonction originelle, une ,,raison" qu'il oppose à la raison *théorique* ou *sophistique*. C'est ici que l'opportuniste mondain Francis Bacon, qui jamais ne perdit l'empreinte de son éducation puritaine, est plus radicalement chrétien que le martyr sans compromis Pierre de la Ramée, qui ne sonda pas toute la profondeur de la théologie réformée.

La différence entre l'empirisme baconien et l'humanisme chrétien se révèle nettement si l'on compare l'attitude de Francis Bacon en 1623 avec celle de Simon Grynée, l'ami de Calvin, en 1555. Grynée, qui avait de grands mérites dans l'édition de la littérature classique, s'intéressait aussi aux arts libéraux et à leurs applications dans la vie commune. Pourtant la conclusion qu'il tire de la découverte des nouveaux continents est précisément contraire à celle de Bacon. Grynée glorifie la force de l'esprit humain rétabli dans son activité naturelle, qui parcourt les régions terrestres et célestes où son corps ne peut pas pénétrer et qui connaît non seulement les cieux, mais aussi, d'avance, par la géographie mathématique, les possibilités de la découverte de nouveaux pays [4]). D'autre part, Bacon, à l'occasion du même sujet, accentue l'orgueil de l'esprit humain: les savants ont démontré que les antipodes n'existent pas, mais de simples navigateurs sans éducation prouvent le contraire par les observations faites pendant leurs voyages [5]). Donc, pour Grynée la chute de l'homme consiste, dans le domaine de la science, en ce qu'il n'a pas été fidèle à lui-même et s'est laissé dérouter par la tradition, l'autorité, le préjugé, tandis que pour Bacon la chute de l'homme consiste, dans le domaine de la science, en ce qu'il n'a pas obéi aux lois impérieuses (non de sa propre nature, mais) de la Création hors de lui. Pour Grynée la découverte des nouveaux pays est donc un triomphe de la raison, pour Bacon une humiliation de la raison. L'un conclut que l'homme n'a pas assez suivi la raison, l'autre qu'il a eu trop confiance en elle.

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[4]) Praefatio Simonis Grynaei ad Collimitium, in: Novus Orbis Regionum ac Insularum veteribus incognitarum... Basileae 1555.

[5]) Cf. R. Hooykaas, Philosophia Libera, London 1957, pp. 18—19.

Or, il est évident que Ramus occupe une position intermédiaire entre Grynée et Bacon. D'après lui, il n'y a nul champ, quelque fécond qu'il soit, qui ne porte quelques mauvaises herbes. La sagesse unanime de tous les sages anciens tenait que les tropiques sont inhabitées à cause de la grande chaleur, mais ,,l'expérience de marchands et de navigateurs illettrés a réfuté cette sagesse''. La vraie et ancienne sagesse est donc celle qui est la plus conforme à l'expérience humaine [6]). Ramus diffère ici de Bacon en ce qu'il ne met pas ce problème sur le niveau religieux, mais sur le niveau philosophique seulement. C'est une erreur de méthode, une *faiblesse* de l'intellect plutôt qu'une corruption de la volonté, une folie plutôt qu'un acte de révolte et d'orgueil, qui cause, dans le domaine de la science, le déraillement de l'esprit humain.

Il y a une contradiction interne dans le ramisme. En tant que théologien Ramus se prosterne devant le Dieu de la Révélation biblique, qui dans sa souveraineté absolue, gouverne le monde comme il Lui plaît. La ,,raison naturelle'' se tait absolument devant les décrets de Dieu. D'autre part, dans sa philosophie Ramus semble être assez rationaliste: les notions générales dans l'esprit correspondent adéquatement aux choses en dehors de l'esprit. Malgré son mépris pour les querelles scolastiques on peut le rapprocher du nominalisme en théologie et du ,,réalisme'' en philosophie [7]).

La théologie ,,naturelle'' occupe une place très modeste chez Ramus, mais, par contre, dans la philosophie et les sciences le pouvoir originel de la raison semble être intact. Loin de lui l'idée d'une nature essentiellement incompréhensible que l'on peut décrire mais non pas comprendre, ou même l'idée d'une telle *corruption* de la raison qu'il lui faudrait se laisser *corriger*, qu'elle ait besoin d'être ramenée dans la voie droite par une *soumission* à la révélation divine manifestée dans les créatures. Ce qui pour Ramus n'est qu'une question d'erreur en méthode scientifique, est pour Bacon un défaut moral.

Mais, d'autre part, il n'est pas du tout un vrai rationaliste: la

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[6]) Actio math. sec. 1566; Collect. p. 540.

[7]) Ch. Waddington dit ,,qu'il n'est nullement réaliste'' (o.c. p. 358) et qu'il se moque de la querelle surannée ,,où quelques historiens lui font prendre parti''. M. P. Miller dit que sa doctrine ,,dans les mains de ses disciples sinon dans les siennes mêmes, devint une renaissance de la philosophie ,,réaliste'' sous un déguisement humaniste'', et que la division en péripatéticiens et ramistes correspondait à peu près à celle en nominalistes et réalistes (Miller, op. cit. p. 346). Le problème demande à être approfondi.

pratique, la *méthode* de Ramus est assez empiriste, parce qu'il n'admet pas que la raison puisse faire des déductions dans le vide. C'est toujours dans le concret, et c'est toujours indissolublement liée à l'observation des phénomènes qu'agit la raison naturelle (contrairement à la raison sophistique). Le fait qu'il rejette la distinction aristotélique: matière, forme, et privation et qu'il admet la notion de matière (mais dans un sens concret, non-aristotélique) démontre qu'il ne veut pas pénétrer *derrière* les phénomènes par une activité indépendante de l'esprit, mais que même les notions physiques les plus générales doivent correspondre à quelque réalité concrète. En dépit de son affinité avec Platon, son empirisme dépasse les limites qu'imposerait un strict platonisme là où il conçoit les mathématiques d'une façon presque aussi empiriste que les sciences naturelles.

XIV

RAMUS, PARACELSE ET LA „THEOLOGIA PRISCA"

A. *Ramus et Paracelse.* — Paracelse, Vives, Palissy, Recorde et la tradition des artisans. — Différences entre Ramus et Paracelse. — B. *La „philosophia prisca"*. Son origine hermétique; sa prétention biblique. — L'attitude de Ramus à l'égard de la philosophie hermétique et de la science des païens. — La physique de Moïse. — L'opinion de Calvin. — Les sources possibles des sciences au 16e siècle.

A. *Ramus et Paracelse*

Ramus n'était pas le premier à reconnaître que le philosophe peut apprendre beaucoup au contact des artisans, des ingénieurs, des hommes de pratique. Quoique médecin, Paracelse n'avait pas reculé devant des discussions avec les sages-femmes, les tziganes, les paysans. Il avait acquis sa connaissance de la chimie en fréquentant mineurs et alchimistes et il avait proclamé le devoir des médecins de ne pas s'habiller en robes rouges mais en tablier de cuir et de se salir les mains avec les charbons des fourneaux chimiques.

Louis Vivès avait dit également que le philosophe doit tenir en estime les travaux manuels et étudier les techniques et les arts mécaniques en visitant les boutiques et les ateliers [1]).

Un peu plus tard, Bernard Palissy s'est vanté de substituer aux raisonnements philosophiques des arguments qui contentent „la veuë, l'ouye et l'atouchement" [2]).

Paracelse allait botaniser avec ses élèves aux environs de Bâle, au lieu de se limiter à l'enseignement livresque; Vivès voulait réformer l'éducation en donnant plus de place aux choses utiles et concrètes. Et Robert Recorde (c. 1510—1558) avait déjà écrit ses manuels de mathématiques et d'astronomie dans lesquels il enseignait la „sphère" en obligeant les élèves de faire du ciel et de la terre un modèle en papier. Il avait l'intention de réviser le but et la méthode de l'enseignement des arts; lui aussi il préférait l'usage pratique aux théories abstraites et lui aussi il insistait sur l'ordre juste de l'enseignement et préparait une série de manuels. Mais, tandis que Ramus commença par le trivium, Recorde s'était limité aux arts mathématiques du quadrivium [3]).

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[1]) J. L. Vives, De tradendis disciplinis, lib. IV, Opera I, p. 498.

[2]) Palissy, l. c. Oeuvres, p. 166.

[3]) Cf. F. R. Johnson and S. V. Larkey, in The Huntington Library Bulletin 7 (1935), p. 80.

L'Arithmétique de Recorde („The Grounde of Arts") fut publiée en 1542, c'est à dire avant les livres de logique de Ramus et 13 ans avant l'Arithmétique de Ramus; sa Géométrie („The Pathway to Knowledge") en 1551, et son Astronomie („The Castle of Knowledge") en 1556; son ouvrage sur la géodésie („The Gate of Knowledge") a disparu complètement. D'autre part il n'y a aucune trace d'évidence que Ramus ait connu l'œuvre de Recorde [4]).

Presque tout ceci s'était passé avant Ramus, ou du moins hors de la sphère d'influence de Ramus. Mais Ramus devint *chef de parti* à cause de son opposition ouverte aux traditions et parce qu'il offrit tout un programme anti-scolastique. Ceux qui faisaient la guerre à la scolastique, à Aristote, à la tradition, devaient se rassembler sous la bannière de Ramus. Autour de lui se ralliaient les novateurs qui ne se contentaient ni de la réforme littéraire entreprise par l'humanisme ni de la continuation de l'enseignement scolastique.

Sans doute, le ramisme était et devenait assez traditionaliste lui-même; il faisait souvent plus de bruit que de besogne. Ses réformes étaient souvent purement verbales. Mais c'était pourtant l'avant-garde qui s'y ralliait, c'étaient les jeunes gens qui allaient écouter Ramus pendant son court séjour à Lausanne et à Genève et qui l'acclamaient à Heidelberg en dépit de leurs maîtres académiques.

Cependant, il y avait encore un autre *chef de parti* parmi les savants anti-scolastiques, à savoir Théophraste Paracelse. Tous les deux furent des esprits indépendants, mais Ramus fut un représentant de l'humanisme chrétien, qui demeurait dans les confins du classicisme, tandis que Paracelse défierait toute classification, à moins qu'on ne le compte parmi ces chercheurs libres, non-conformistes, que l'on désigne par le terme „homme de la Renaissance" plutôt que par celui d'„humaniste". Il continue moins la tradition des vrais classiques que celle de l'hermétisme, du néoplatonisme, de la magie et de l'alchimie.

Cela explique pourquoi Paracelse ne put faire partie que passagèrement du cadre universitaire de Bâle [5]), tandis que Ramus occupait, malgré les persécutions, une chaire pendant quelques dizaines d'années. Ramus était sobre dans sa vie, modéré dans ses idées (la violence avec laquelle il les émet parfois n'a rien d'étonnant chez un humaniste de l'époque): il était le novateur dans une révolution bourgeoise. Paracelse, immodéré et irrégulier dans ses vagabondages et ses coutumes, était un personnage romantique, un homme qui était et devait rester seul, en dépit de la foule des paracelsistes. Son non-conformisme est du type radical et ,,fanatique", qui, sur le plan religieux, se manifestait surtout dans l'anabaptisme.

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[4]) Johnson and Larkey, l. c. p. 81.

[5]) Sans doute, ce n'étaient pas les autorités universitaires qui importunaient Paracelse, mais son caractère nous garantit qu'à la longue il aurait été insupportable même aux Bâlois, pourtant extrêmement tolérants.

Il y a quelque ressemblance entre la ,,raison" de Ramus et la ,,lumière naturelle" de Paracelse. La raison naturelle du ramisme évolue soit vers le rationalisme cartésien, soit vers l'empirisme rationnel de Bacon, (qui, malgré leurs différences, partagent tous les deux l'utilitarisme raméen). D'autre part, la lumière naturelle de Paracelse se rapproche plutôt de la lumière intérieure des mystiques, des spiritualistes et des théosophes. La raison naturelle chez Ramus est un pouvoir inné par lequel l'homme agissant et réfléchissant naturellement sur les choses, agit et pense conformément à la nature des choses. À Paracelse, par contre, une espèce d'illumination n'est pas étrangère: il y a une tendance vers le sentiment et l'intuition plutôt que vers la raison, et cette intuition est fondée dans l'unité et la correspondance de l'homme avec Dieu et avec la nature.

Par conséquent, le paracelsisme et le ramisme sont parfois des alliés, parce qu'ils s'opposent tous les deux à la scolastique et parce qu'ils proclament tous les deux une alliance avec la pratique des artisans et préparent l'empirisme scientifique. Et, tandis que le caractère de la raison naturelle empêche Ramus d'être un empiriste pur sang, la lumière de la nature chez Paracelse détermine et dirige même d'avance les résultats concrets de l'expérimentation: il y a trois principes chimiques, parce que l'analyse chimique les découvre mais aussi parce que ,,tout art qui cherche plus de trois, est fondamentalement faux, car la Trinité a parlé" et donc toutes choses doivent se composer de trois éléments! 6)

Pourtant, Ramus est trop sobre, trop français et (l'on pourrait dire même) trop aristotélicien pour avoir une affinité essentielle avec Paracelse 7).

Ramus a loué Paracelse en l'appelant l',,Asclépiade allemand" 8) avec qui la médecine parfaite semblait être venue, et les paracelsistes

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6) Cf. R. Hooykaas, Het Begrip Element. Utrecht 1933, p. 92. Voyez aussi notre article: ,,Chemical trichotomy before Paracelsus?" Arch. Intern. Hist. Sc. (1949) p. 1074.

7) Voyez aussi plus bas XVI.

8) ,,Theophrastus nempe germanicus hic Asclepiades fuit". P. Ramus, ,,Basilea" 1571, p. 23.

ont souvent cité cet éloge pour démontrer l'alliance du ramisme avec le paracelsisme. Cependant, Ramus n'a rien emprunté à Paracelse et, à part l'opposition commune contre le traditionalisme, leur différence est si profonde et si essentielle, que — du point de vue des idées positives — des deux efforts pour trouver un chemin nouveau, celui de Ramus a préparé la science moderne, tandis que celui de Paracelse paraît aboutir finalement à une impasse.

Si l'on compare le fondateur de l'astronomie moderne, J. Kepler, à Ramus, il est déjà évident que Kepler est un métaphysicien, qui apprécie fortement les spéculations des métamathématiciens platoniciens et néoplatoniciens sur les nombres et les figures, tandis que Ramus les rejette catégoriquement (cf. plus haut VIII E). Or, Paracelse va infiniment plus loin que Kepler et quand Kepler polémise avec le paracelsiste Robert Fludd, il agit en défenseur de la science d'observation et de calcul contre la science qui prétend être acquise par l'intuition. On peut en conclure a fortiori à l'incompatibilité essentielle du ramisme avec le *paracelsisme*.

B. *La „philosophia prisca"*

La différence apparaît clairement si nous comparons leur attitude à l'égard de la „philosophia prisca". D'après une ancienne tradition, héritée des Juifs hellénisants, les sciences que le premier homme connut avant la chute, et qu'il n'avait pas tout à fait perdues après, furent cultivées par Seth (le troisième fils d'Adam), qui, prévoyant le Déluge, grava les secrets des mathématiques et de l'astronomie sur deux piliers, l'un en pierre, l'autre en laiton. Plus tard, Abraham enseigna les arts aux Égyptiens. De l'Égypte ils se seraient répandus par la Grèce et l'Italie.

Ce récit de Flavius Josephus fut repris par les encyclopédistes chrétiens du Moyen Âge (Isidore de Séville, Hrabanus Maurus) et par le bénédictin Remigius d'Auxerre 9). Cette tradition fut assez généralement admise; on la retrouve aussi chez Ramus 10) et chez le ramiste Thomas Hood 11).

Cependant, l'idée que les païens auraient reçu leur science des Hébreux, avait des conséquences plus graves. Les plus anciens philo-

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9) Cf. C. E. Lutz, Remigius' ideas on the origin of the seven liberal arts. Medievalia et Humanistica *10* (1946), pp. 37, 41.

10) Actio secunda pro regia mathematicae professionis Cathedra, habita in Senatu 3 Id Martis anno 1566; Collect. p. 535.

11) A Copie of a Speache. London 1588.

sophes auraient donc gardé une réminiscence de la sagesse originelle du peuple de Dieu, ou bien ils l'auraient apprise de nouveau par un contact immédiat avec Israel. Les écrits d'Hermès Trismégiste, les écrits orphiques, les oracles chaldéens et sibyllins, (presque tous des produits de l'Antiquité helléniste), et aussi les écrits de Platon, (qui aurait rencontré Moïse), contiendraient des preuves que quelques païens possédaient une notion vague de la religion de Dieu (parfois même par illumination directe). C'est ainsi que ,,Hermes'' connut la Trinité, selon l'opinion de Pierre d'Ailly [12]) et d'Alain de Lille [13]).

Pour maintenir une telle théorie on supposait souvent que ces auteurs avaient écrit délibérement d'une façon obscure et qu'il fallait les interpréter allégoriquement.

La théologie des ,,prisci'' florissait spécialement au XVe et XVIe siècles [14]). Elle servit souvent à mettre en contraste la piété de Platon et d'Hermès et l'impiété d'Aristote. Parfois cette théologie répondait au besoin de construire une théologie *chrétienne* tout à fait libre de l'influence du paganisme aristotélicien. Naturellement, cette naïveté produisit l'effet contraire: les écrits ,,hermétiques'' ne sont pas plus chrétiens que ceux des philosophes grecs, et la ,,philosophie mosaïque'' ou ,,physique mosaïque'' (exégèse du commencement de la Genèse influencée par la theologica prisca) fut en grande partie une théosophie néoplatoniste et néopythagoricienne, parfois plus éloignée du christianisme biblique que la synthèse scolastique.

Pour juger à sa valeur le sens historique d'un auteur et la compréhension qu'il montre à l'égard du message biblique et la façon dont il l'entend, on n'a, souvent, qu'à examiner le degré de crédulité qu'il accorde à la ,,théologie ancienne''. Or, Ramus ne s'engage pas loin dans le chemin de cette théologie. Il ne veut pas qu'on tire des écrits des Anciens le moindre argument en faveur de la révélation, mais il croit que la lumière naturelle dévoile quelques traces de la connaissance de Dieu à toutes les nations [15]). Il croit, par exemple, que Platon a appris la doctrine de la Trinité avec Moïse. Cependant, la Bible était à ses yeux la seule source solide de la théologie chrétienne. D'autre part, son principe de n'admettre aucun argument théologique en ,,philosophie'' (la physique y comprise) le mettait à l'abri des tentations de la „physique Mosaïque". C'était une position très modérée et très sage pour l'époque et l'on ne voit pas pourquoi M. Walker dit que Ramus avait „un point de vue protestant étroit, qui aurait exclu la théologie ancienne sans son amour de la rhétorique et sa haine d'Aristote" [16]).

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[12]) Cf. B. Meller, Studien zur Erkenntnislehre des Peter von Ailly. Freiberger Theologische Studien *67*, Freiburg 1954, p. 199, 202.

[13]) Meller, o.c. p. 90—91.

[14]) Cf. D. P. Walker, The Prisca Theologia in France. J. Warburg and Courtauld Inst. *17* (1954) p. 204.

[15]) Comment. de relig. christ. lib. I init.; Waddington, o.c. p. 360.

Évidemment, Ramus n'était pas du tout „étroit". Malgré tout, l'emploi de citations prises dans les auteurs classiques dans l'exposition théologique, lui sert de „condiment" pour rendre la lecture plus attrayante; elle est donc en effet en rapport avec son amour pour la rhétorique, bien que cela n'implique pas du tout une concession à la „theologia prisca". Sa „haine d'Aristote" s'était atténuée déjà longtemps avant qu'il écrivît ses „Commentaires de la religion chrétienne", vers la fin de sa vie. Il semble que Ramus se montra vrai savant et bon théologien lorsqu'il rejeta la „theologia prisca" et n'eut pas d'indulgence pour une „philosophie mosaïque".

Ramus et Paracelse ont tous les deux reconnu le caractère païen de la théologie et de la métaphysique d'Aristote, mais Paracelse (qui ne voyait rien de bon en Aristote, ce que l'on ne peut pas dire de Ramus) était très crédule là où il s'agissait des traditions „hermétiques" et théosophiques qui se ranimèrent au XVIe siècle.

Il faut se rappeler que la Réforme critiquait la théologie scolastique, accusée de mêler la philosophie païenne au message biblique. Luther et Calvin construisirent la théologie seulement sur l'Écriture Sainte et, surtout Luther critiquait sévèrement le caractère païen de la théologie et de l'éthique d'Aristote et se montrait anti-métaphysicien.

Ramus, qui montrait une tendance nettement anti-métaphysique, n'admettait pas l'appel à l'autorité des philosophes païens en matière de théologie chrétienne. D'autre part, il ne croyait pas que la corruption de l'homme soit telle que les philosophes païens ne pourraient pas offrir en dehors des domaines de la théologie et de l'éthique des données valables pour fonder les arts et les sciences. Tant que ces données étaient conformes à „la nature", selon le sens socratique du terme, elles étaient acceptables pour lui. Ainsi il occupait la même position que Calvin, qui était d'avis que ceux qui calomnient les bonnes sciences à cause de leur origine païenne, offensaient le Saint Esprit qui avait confié aux païens ces dons magnifiques [17]).

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[16]) Walker, l. c. p. 256: „He had a narrow protestant outlook which would have excluded prisca theologia were it not for his love of rhetoric and hatred of Aristotle". Dans son article intéressant M. Walker fait la distinction entre les „libéraux" et les „illibéraux" (l. c. p. 252); les premiers seraient favorables à la théologia prisca, les seconds défavorables. Il nous semble que ce n'est pas une preuve de libéralisme que de confondre les fables avec l'histoire (c'est ce que font les adhérents de la theologia prisca). En outre, il faut remarquer que l'attitude d'un père de l'église ou d'un réformateur, et également celle de Ramus, à l'égard des auteurs classiques dépendait de l'occasion et du but concret d'un écrit. Et un „narrow protestant outlook", comme l'appelle M. Walker, conduisit très souvent précisément à une *acceptation* de la „philosophie mosaïque" (qui est une „theologia prisca" déguisée), p. e. chez le puritain Richard Bostocke (1568) et quelques théologiens luthériens.

Le point de vue plus radical et, à certains égards, plus facile, attirait cependant beaucoup de savants, qui non seulement blâmaient comme païennes la théologie et la métaphysique d'Aristote et voulaient lui substituer une théologie et une éthique fondées sur la Bible, mais qui auraient voulu tirer les principes de la „physique" également de la Bible. Or, ceux-ci se laissaient presque tous séduire par la fable de la „prisca philosophia" et de la „prisca theologia", c'est-à-dire qu'ils croyaient tirer des données soi-disant physiques de la Genèse, mais qu'ils lisaient en réalité à travers les lunettes de la philosophie „hermétique", de l'alchimie, du paracelsisme. Leur désir d'avoir une science naturelle purement biblique, fondée sur le texte de l'Écriture et non pas sur la philosophie païenne, les conduisit donc à rejeter Aristote pour accepter quelque autre philosophie païenne qu'ils croyaient être biblique. Désirant écarter de la philosophie et de la théologie toute influence païenne, ils arrivaient par le détour de la „theologia prisca" à un résultat qu'ils voulaient éviter précisément. Leur effort d'abandonner le syncrétisme théologique des scolastiques les poussait vers un syncrétisme hermétique; par moyen de l'artifice de la philosophia prisca ils étaient libres de choisir un certain type de la philosophie des païens (fragments de Platon et de la philosophie néoplatonicienne), qu'ils croyaient de bonne foi être „biblique" et „mosaïque", contrairement à la philosophie du païen Aristote. Richard Bostocke, un paracelsiste [18]), et Joseph du Chesne, un médecin hermétiste de l'école de Paracelse [19]), parmi les protestants, et le médecin brabançon J. B. van Helmont parmi les catholiques romains, sont des représentants caractéristiques de cette philosophie.

Ici encore Calvin était d'une opinion toute contraire. Il n'empruntait pas de données scientifiques à la Bible et niait même énergiquement qu'il fût possible d'y trouver des secrets de la science naturelle [20]). Pour obtenir des renseignements sur la construction de l'univers il se fiait davantage aux astronomes de son temps et de l'Antiquité que sur ,,Moïse", qui, d'après lui, avait écrit d'une façon populaire.

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[17]) Cf. R. Hooykaas, „Phil. Libera", p. 11—12; „Science and Reformation", Cahiers d'Hist. Mondiale *3* (1956) p. 128.

[18]) Cf. R. Hooykaas, Cahiers d. Hist. Mond. *3*, p. 134; Phil. lib. p. 11.

[19]) Cf. R. Hooykaas, Het begrip Element in zijn historisch-wijsgeerige ontwikkeling, diss. Utrecht 1933, p. 126—127; Die Elementenlehre der Iatrochemiker, Janus *41* (1937), p. 9—15; 26—27.

Il nous semble que le savant du XVIe siècle avait le choix entre cinq possibilités qui lui furent offertes comme sources de la science de la nature:

1⁰ les écrits des Anciens.
2⁰ l'illumination directe.
3⁰ la réflexion rationnelle.
4⁰ l'Écriture Sainte.
5⁰ l'observation de la nature.

Pour les paracelsistes l'intuïtion et l'Écriture étaient les sources principales, tandis que Calvin était d'avis qu'il fallait observer et fouiller les oeuvres de la création [21]). Ramus adhérait à cette dernière conception; il est donc assez étrange que beaucoup de paracelsistes croyaient que le ramisme ne fût pas incompatible avec leur ,,philosophie mosaïque" [22]).

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[20]) Cf. R. Hooykaas, Cahiers Hist. Mond. *3* (1956), p. 135—138; Phil. Lib. p. 12—15.

[21]) Cf. Cahiers d'Hist. mond. *3* p. 132—135.

[22]) Cf. plus bas XV E.

LA DIFFUSION DU RAMISME

XV

A. *L'Allemagne et la Suisse.* — B. *La Hollande.* — C. *L'Angleterre.* — Le ramisme à Cambridge. — Le ramisme à Londres; Thomas Hood; Gresham College. — Le puritanisme. — D. *La Nouvelle Angleterre.* — E. *La Suède.* — L'anti-humanisme des ramistes suédois.

Pendant la seconde moitié du XVIe siècle et la première moitié du XVIIe le ramisme occupait aux universités une place analogue à celle du cartésianisme dans la seconde moitié du XVIIe siècle. En Allemagne, en Angleterre, en Hollande, en Suède, il commença une marche triomphale. En même temps la réaction de la Contre-Réforme essayait de le supprimer en France tandis qu'à l'université jésuite de Fribourg ses livres furent défendus et le ramisme ne pouvait être mentionné qu'en le réfutant.

A. *L'Allemagne et la Suisse*

En Allemagne et en Suisse, (donc dans les pays qui avaient eu un contact immédiat avec Ramus), le ramisme florissait à côté de l'aristotélisme mélanchthonien (le „philippisme"). La logique raméenne pénétrait dans les universités protestantes; elle fut enseignée spécialement à Marbourg, Kassel et Rostock (David Chytraeus) et elle fut divulguée surtout par les écrits de Henning Rennemannus et Frédéric Beurhusius. Une synthèse des deux courants rivaux surgit sous le nom de „philippo-ramisme" (Goclenius, Alstedt, Casmannus). La nouvelle scolastique, en pleine éclosion au commencement du XVIIe siècle, le combattait vigoureusement, de sorte qu'Aristote reprit son autorité presque partout en Allemagne vers 1625. La réaction fut extrêmement violente en Saxe: le ramisme y fut défendu déjà au commencement du XVIIe siècle (à Wittenberg en 1603). À l'université de Helmstadt, d'abord si favorable au ramisme, il fut défendu en 1597. Le ramisme, lié au nom d'un réformé, devint parfois par là même odieux aux représentants d'un luthéranisme exclusif.

En Suisse l'influence du ramisme persista longtemps à Bâle, Zürich et Berne. Le médecin Théodore Zwinger et Thomas Freigius sont les plus connus des disciples immédiats de Ramus à Bâle. De nombreux ouvrages de Ramus furent imprimés à Bâle; le médecin danois Andreas

Krag y publia deux de ses œuvres ramistes. Henri Schor, un maître d'école en Alsace, publia en 1572 un traité ramiste sur la rhétorique, dédié à Sturm. Il y inséra en même temps toute la théorie raméenne de l'éducation [1]).

B. *La Hollande*

En Hollande, où les universités n'avaient pas à porter le lourd fardeau de la tradition médiévale, Ramus avait quelques disciples célèbres. Les plus importants sont les deux Snellius: Rodolphe (1546—1613) et son fils Willebrord (1591—1626). Rodolphe Snellius fut professeur de mathématiques et d'hébreu à Leyde depuis 1578. Il entra pour la première fois en contact avec la logique raméenne à Marbourg et il publia des commentaires sur la Dialectique, l'Arithmétique et la Géométrie de Ramus. En outre, il écrivit une éthique selon la méthode de Ramus et des commentaires sur la Rhétorique d'Omer Talon. Willebrord Snellius, qui succéda à son père, écrivit plusieurs livres de mathématique et de géodésie et fit des expériences physiques qui conduisirent à la découverte de la loi de la réfraction de la lumière (1622) [2]). Il enseignait l'optique à l'université et s'intéressait beaucoup à l'application des mathématiques dans le domaine de la navigation et de l'industrie des Pays-Bas. Il écrivit des notes en marge de la traduction néerlandaise de la Géométrie de Ramus qu'il avait fait faire au pasteur réformé Dirk Houtman.

À Franeker, en Frise, enseignait le célèbre théologien puritain William Ames, qui avait une grande influence sur le ramisme anglais.

C. *L'Angleterre*

L'Angleterre est peut-être plus intéressante par rapport au problème de l'empirisme qui nous intéresse principalement dans cette étude, car c'est là que Ramus trouva un continuateur en Francis Bacon, qui marqua de son empreinte la science moderne. Ramus y avait des correspondants: Jacques Acontius, l'ingénieur italien, qui avait des idées sur la logique et l'éducation qui ressemblaient aux siennes, et John Dee, le mathématicien-astronome, qui inspirait tant d'hommes de science dans ce pays, entre autres Thomas Digges (1545—1595), le copernicien [3]).

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[1]) Schor avait abandonné le secte anabaptiste des davidjoristes, auquel il avait adhéré quand il était à Bâle.

Jean Bauhin (l'aîné), qui entra en relations étroites avec Ramus pendant le séjour de celui-ci à Bâle (Voyez „Basilea") avait été également un davidjoriste.

[2]) Cf. Vollgraff, o.c. p. 30*b*.

Car il faut avouer que, bien que le ramisme ait favorisé le courant expérimental et pratique et lui ait donné des contours plus nets, ce courant existait avant lui et sans lui [4]). C'est probablement l'excellence des ouvrages mathématiques et astronomiques, écrits en anglais par Robert Recorde et Leonard et Thomas Digges, qui rendit les traités de mathématiques de Ramus moins populaires en Angleterre qu'on ne l'aurait espéré. D'autre part les œuvres de Recorde ont probablement facilité l'accueil du ramisme en Angleterre [5]).

Sous Édouard VI les forces du progrès et de la réforme gagnèrent beaucoup d'influence. Les Statuts universitaires de 1549, dressés sous la supervision de John Cheke et Thomas Smith, avaient rétabli la position des mathématiques à l'université, mais les Statuts d'Élisabeth de 1572 négligèrent complètement l'enseignement mathématique. Les forces conservatrices étaient encore les plus puissantes [6]).

Cependant, à Cambridge, le foyer du puritanisme, un démêlé violent éclata en 1570 entre les conservateurs aristotéliciens et les novateurs ramistes. Du côte des ramistes brillait William Temple, le secrétaire de Philip Sidney, qui soutint le ramisme aussi bien que le parti puritain [7]). Un autre ramiste zélé fut George Downame [8]). Le principal adversaire du ramisme fut Everard Digby [9]).

Quoique la logique fût le sujet principal de la controverse, les écrits raméens sur les mathématiques jouaient aussi un rôle considérable. C'était l'éternelle querelle des anciens et des modernes, dans laquelle les ramistes faisaient figure de modernes. Tandis que les conservateurs considéraient les mathématiques comme des sujets pratiques au-dessous de la dignité d'une université, les ramistes de Cambridge déployaient un grand zèle pour obtenir leur rétablissement dans l'enseignement et s'intéressaient à leur application pratique. Un de leurs partisans, Gabriel Harvey, attaqua la doctrine d'Aristote selon laquelle le ciel se compose d'un cinquième élément, essentiellement différent des éléments terrestres, et dans „Pierces supererogation" il écrivit dans un esprit éminemment ramiste: „Celui qui se souvient de Humphrey Cole, un mécanicien mathématique, Matthew Baker, un constructeur de navires, John Shute, un architecte, Robert Norman, un navigateur, William Bourne, un canonnier, John Hester, un chimiste, ou d'un empirique de pareille finesse et subtilité (on se souviendra de Cole, Baker, Shute, Norman. Bourne, Hester, quand de plus grands savants seront oubliés), celui-là est un homme orgueilleux s'il méprise les artisans experts, ou quelque praticien intelligent et zélé, quand même celui-ci serait sans éducation scolaire et sans lettres . . . et quel mathématicien profond, comme Digges, Harriot ou Dee, n'estime-t-il pas le mécanicien habile?" [10])

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[3]) Cf. R. Hooykaas, Thomas Digges' Puritanism. Arch. Intern. Hist. d. Sc. *8* (1955), p. 145—159.

[4]) Cf. plus haut au début de XIV.

[5]) Johnson and Larkey, l. c. p. 85.

[6]) Cf. J. B. Mullinger, The University of Cambridge, Vol. II, Cambridge 1884, p. 109—111; F. R. Johnson, Astronomical thought in Renaissance England, Baltimore 1937, p. 196.

[7]) La publication la plus importante de Temple, „P. Rami Dialecticae libri duo, scholiis G. Tempelli Cantabrigiensis illustrati. Cantabrigiae 1584", fut dédié à Sir Philip Sidney. Cf. Miller, o. c. p. 479. Les „Commentariorum de religione Christiana libri IV" furent publiés avec une „Vie de Ramus", par son élève Théophile Banosius, qui les dédia également à Philip Sidney.

[8]) Downame commentaria la Dialectique de Ramus et prononça un discours en son honneur. Plus tard il devint évêque de Derry et il se montra alors un adversaire de l'arminianisme.

[9]) Mullinger, o. c. p. 409—413.

Il n'était pas le seul partisan de l'éducation mathématique et scientifique parmi ceux qui ont fait leurs études à Cambridge du temps que la controverse ramiste y sévit. Il y avait alors Mark Ridley, un auteur important sur le magnétisme, qui fondait ses nouvelles conceptions physiques sur les expériences et les observations. Il y avait aussi William Kempe, qui traduisit l'Arithmétique de Ramus et écrivit „The Education of children in learning" (1588), dans lequel il plaida pour l'enseignement mathématique. Il y avait William Bedwell, qui écrivit sur les instruments scientifiques et traduisit et commenta la Géométrie de Ramus, et Thomas Hood, qui écrivit plusieurs traités populaires sur des sujets mathématiques et scientifiques, entre autres sur la navigation et l'astronomie. Il publia aussi un abrégé en anglais de la Géométrie de Ramus (1590).

Ils étaient tous des Ramistes. Thomas Hood fut le premier lecteur public de sciences „mathématiques" théoriques et pratiques à Londres. Ces leçons publiques se firent sous les auspices du magistrat de la ville et plus spécialement d'un marchand riche, Thomas Smith. Elles furent établies en 1588, et surtout destinées aux officiers de la milice érigée sous la menace de l'Armada, mais tous les citoyens y avaient libre accès; les artisans et les navigateurs y assistaient aussi bien que les militaires. Hood enseignait les principes de l'arithmétique, de la géométrie et de l'astronomie, et ensuite leur application dans la construction d'instruments et de cartes géographiques et dans la solution de problèmes de navigation et de géodésie [11]), donc tout à fait selon l'esprit raméen. Son discours inaugural, prononcé dans la maison de Thomas Smith, est pénétré des idées de Ramus. Il insiste sur les applications des arts mathématiques: l'arithmétique et la géométrie, „the knowledge of measuring wel" [12]).

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[10]) The Works of Gabriel Harvey, ed. Grosart vol. II, p. 289—290.

Il faut reconnaître pourtant, que malgré l'influence considérable et même décisive de Ramus sur ces auteurs géométriques, on ne saurait pas décider s'ils étaient des ramistes doctrinaires, car ils ne s'occupaient pas de la dialectique.

Lorsque la controverse ramiste battait son plein à Cambridge, le jeune Francis Bacon y étudiait aussi. Par conséquent, il est très probable qu'il ait subi l'influence de l'utilitarisme ramiste, comme il a probablement assisté aussi aux conférences du maître Palissy, artisan empiriste et anti-traditionaliste, lorsqu'il était lié à l'ambassade anglaise à Paris. Cependant Bacon n'est pas un ramiste proprement dit: il critique Ramus et ne partage que son utilitarisme et sa tendance à établir la collaboration entre savants et artisans.

Vers la fin du siècle, la coopération des artisans et des savants, si ardemment souhaitée par Ramus, s'était effectuée par la fondation du Gresham College. Là était réalisé tout ce qu'on ne pouvait pas obtenir des universités: des leçons régulières de mathématiques, d'astronomie et de sciences appliquées en latin et en langue vulgaire, par des professeurs compétents. Là, de plus, on organisait des rencontres entre artisans de la ville et professeurs. Or, les premiers professeurs de Gresham College étaient presque tous des Puritains.

Quand le puritanisme se développa en mouvement démocratique et s'éloigna du royalisme pour s'engager dans la voie du républicanisme en politique, et se tourna du presbytérianisme vers le congrégationalisme en théologie, les idées de Ramus sur les droits de la congrégation ont pu contribuer à sa popularité parmi les Indépendents [13]), qui, du reste, étaient des partisans fervents de la réforme de l'université et de l'intégration des sciences expérimentales dans l'enseignement académique[14]). Le plus célèbre ramiste était John Milton, qui écrivit une logique d'après les principes de Ramus, publiée en 1672[15]), c'est-à-dire au moment même ou le ramisme avait été remplacé en philosophie par le cartésianisme et en science par l'influence de Bacon.

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[11]) Johnson, o.c. p. 198—201.

[12]) A Copie of the Speache: made by the Mathematicall Lecturer unto the Worshipfull Companye present, at the house of the worshipfull M. Thomas Smith, dwelling in Gracious Street: the 4. of November 1588.

[13]) Par contre, nous ne croyons pas que la thèse d'une relation intime entre l'arminianisme et le ramisme („La secte des arminiens en général adopta la dialectique de Ramus". Waddington, o.c. p. 395) soit fondée sur les faits. Cette thèse a été souvent répétée, mais, comme l'a fait ressortir J. P. N. Land dans son oeuvre posthume (De wijsbegeerte in de Nederlanden, Den Haag 1899, p. 115; cf. Vollgraff, o.c. p. 18*b*), les philosophes arminiens Grotius et Jacchaeus étaient de purs aristotéliciens.

Le pasteur puritain John Wilkins, qui jouait un rôle important dans la fondation de la „Royal Society", et qui se distinguait par ses opinions hardies en astronomie, se montra disciple fidèle de Ramus et de Bacon dans son „Mathematical Magick: or the wonders that may be perform'd by Mechanical Geometry" (London 1648). Sa défense de la dignité de la mécanique répète les idées émises au même sujet dans les „Scholae Mathematicae".

Au commencement du XVIIe siècle ramisme et puritanisme étaient à peu près synonymes en Angleterre, et vers 1660 le „fanatisme" (comme le puritanisme était nommé par ses adversaires) et la „nouvelle science" (new learning) étaient devenus indissolublement liés dans les polémiques des anciens et des modernes.

D. *La Nouvelle Angleterre*

Dans la Nouvelle Angleterre (New England), la colonie des puritains en Amérique, le ramisme devint pratiquement la philosophie officielle. Aucune branche du protestantisme n'était intrinsèquement plus disposée à accueillir les doctrines de Ramus que le puritanisme. Plaidait en faveur de Ramus le fait qu'il était un martyr pour la cause de l'Évangile, qu'il avait attaqué la tradition et qu'il avait recommandé la collaboration des artisans et des savants. Au Harvard College, l'académie de la colonie congrégationaliste, le ramisme règnait en maître suprême et non seulement la logique et la rhétorique de Ramus y déterminaient l'enseignement, mais on y retrouvait aussi l'amour des sciences si caractéristique de Ramus[16]).

Tandis que beaucoup de presbytériens adhéraient à l'aristotélicisme, le congrégationalisme de New England optait pour Ramus et Talon, et reconnaissait que Ramus avait inauguré „the Congregational way of church government"[17]). Le ramisme y florissait jusque dans le XVIIIe siècle et les théologiens de la Nouvelle Angleterre avaient à accomplir la tâche difficile de réconcilier les tendances „fidéistes" et les tendances „rationalistes" du ramisme. Comment ils ont réussi à faire ce tour de force a été admirablement exposé par M. Miller[18]).

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[14]) Cf. R. Hooykaas, Cahiers Hist. mond. p. 121; Phil. lib. p. 19—21.

[15]) Artis logicae plenior institutio ad Petri Rami methodum concinnata.

[16]) Cf. P. Miller, The New England Mind. The seventeenth century. New York 1939.

[17]) Miller, o.c. p. 120.

E. *La Suède*

Dans quelques pays purement luthériens, en particulier au Danemark (Andreas Krag) et en Suède, le ramisme trouva des disciples fougueux.

En Suède le ramisme acquit sa popularité à partir de 1580[19]). Il s'y présentait parfois lié au paracelsisme, et même les plus hauts dignitaires, l'évêque Paulinus Laurentius Gothus et le chancelier Johannes Skytte, y adhéraient. Peut-être Laurentius fut-il tout autant bibliciste que ramiste, tandis que chez Skytte le ramisme l'emporta.

Laurentius Paulinus Gothus, qui fit ses débuts en publiant un éloge des arts libéraux et de la philosophie[20]), critiqua l'éthique, la métaphysique et la physique d'Aristote comme des „deliramenta pagana"[21]) et jugea bientôt la philosophie des païens impuissante et privée de l'illumination céleste[22]). Laurentius s'écarta de plus en plus de l'humanisme chrétien de Ramus pour occuper une position anti-humaniste et radicale. Il écrivit une cosmogonie mosaïque (Historia arctoa 1636) et voulut fonder non seulement la connaissance des choses spirituelles, mais aussi celle des choses naturelles sur la Parole de Dieu[23]).

L'on a fait ressortir que le dédain de la philosophie chez Laurentius est quelque chose de non-raméen et que, par conséquent, il n'est pas un représentant typique du ramisme suédois (W. Sjöstrand, Till ramismens historia i Sverige. Lychnos 1940, p. 225). M. Lindroth, dans son excellent exposé du paracelsisme suédois, modifie cette opinion; il considère la position finale de Laurentius (son anti-humanisme) comme inspirée surtout par le ramisme (o.c. p. 72). Sa méthode en physique (la „physique mosaïque") proviendrait de ses convictions ramistes: il se méfie de la capacité de l'homme de découvrir la vérité dans les questions fondamentales de la physique (o.c. p. 76). M. Lindroth fait ressortir que le ramisme, dans la personne du disciple immédiat de Ramus, Thomas Freigius, (voir ses „Quaestiones physicae" (1579), avait substitué la philosophie mosaïque à la physique d'Aristote (o.c. p. 76).

Quoiqu'il nous soit impossible de nous faire un jugement solide sur le caractère du ramisme suédois sans la connaissance des travaux originaux de Laurentius, Skytte, e.a., M. Lindroth nous fournit lui-même des faits qui ne semblent pas justifier tout à fait son opinion sur la pureté du ramisme des Suédois et de Laurentius en particulier. Ces faits nous donnent l'impression que la critique de la philosophie païenne chez Laurentius et quelques autres théologiens suédois était inspirée par les écrits de Luther (o.c. p. 73), et que cette critique montrait aussi une forte ressemblance avec la pensée spiritualiste dont les écrits hermétiques et paracelsistes étaient pénétrées (o.c. p. 72). Pourtant, M. Lindroth affirme que le pathos ramiste explique suffisamment les conceptions exclusivement „chrétiennes" de Laurentius (Ibid.). Mais on pourrait dire la même chose avec autant de raison de l'influence luthérienne! (voir o.c. p. 73).

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[18]) Voyez les chapitres V et VI de l'ouvrage cité, à partir de p. 146; notamment p. 156—157; 176—179.

[19]) Cf. S. Lindroth, Paracelsismen i Sverige till 1600-talets mitt. Uppsala 1943, ch. I, § 3.

[20]) De elogio scholarum; cf. Lindroth o.c. p. 70.

[21]) Lindroth, o.c. p. 71.

[22]) Lindroth, o.c. p. 72.

[23]) Lindroth, o.c. p. 75.

M. Lindroth est d'avis qu'un ramiste qui rejetait la physique scolastique ne trouvait chez Ramus rien qu'il aurait pu lui substituer et que la physique mosaïque était la seule qui s'offrait pour la remplacer. D'autre part, il faut accentuer que M. Lindroth met lui-même en évidence que Laurentius emprunte cette philosophie „mosaïque" à Gérard Mercator, le célèbre cartographe néerlandais (o.c. p. 77) et que cette philosophie se rencontrait aussi en dehors des milieux ramistes (o.c. p. 76). En outre, elle n'était pas acceptée par tous les ramistes: la connection avec la physique mosaïque n'est donc pas essentielle pour le ramisme et l'on se demande s'il n'y avait pas d'autres systèmes qui se présentaient: les philosophies présocratiquess et l'atomisme étaient assez répandues vers 1600 et toutes sortes de systèmes éclectiques se sont formées à cette époque à partir de la physique aristotélicienne.

La conclusion que c'est donc sa conviction ramiste qui aurait entraîné Laurentius vers la pensée hermétique-mosaïque (o.c. p. 78) ne nous semble pas tout à fait justifiée. M. Lindroth insiste lui-même sur le fait que pour la compréhension du ramisme suédois l'*humanisme* de Ramus (qui reconnaît des „vérités naturelles") „est de moindre importance" (o.c. p. 62, note 3). Or, la doctrine humaniste de la „lumière naturelle" est essentielle dans la philosophie de Ramus. Elle n'exige pas la physique mosaïque, ou, du moins, elle l'aurait exigée pour des raisons profondément différentes de celles de Laurentius.

Nous reconnaissons, cependant, que Laurentius se montre bon ramiste lorsqu'il attribue une certaine valeur pratique aux arts libéraux, même dans l'exégèse biblique, mais condamne la spéculation libre de l'intellect (o.c. p. 72, note 2), et que le ramisme a une tendance à rejeter la spéculation métaphysique et à n'accepter que les données de l'expérience ou celles de la révélation particulière (o.c. p. 73, note 7). C'était précisément le caractère empiriste, anti-métaphysique de la philosophie de Ramus qui lui fit considérer la matière première comme une *substance* réelle et rejeter la distinction de matière première, forme et privation, (attitude qui a été fidèlement suivie par les ramistes suédois, Laurentius et Skytte).

Le ramisme des théologiens puritains de la Nouvelle Angleterre nous semble plus fidèle aux conceptions de Ramus. Il faut être extrêmement prudent quand on établit des relations essentielles entre le ramisme, la science humaine en général, et la philosophie mosaïque. Des humanistes comme Érasme, critiquaient la confusion de la théologie biblique avec la philosophie païenne; le pilier de l'orthodoxie réformée en Hollande au XVIIe siècle, G. Voetius, adhérait à la nouvelle scolastique, vantait les sciences humaines et — en même temps — montrait de l'indulgence à l'égard de la philosophie mosaïque[24]).

Johan Skytte étudia longtemps à Marbourg (un centre du ramisme) et aussi à Lemgau, où le ramiste Lazare Schoner enseignait. Il insista (dans ses discours de 1599 et 1632) sur l'usage pratique des arts libéraux[25]) et fit l'éloge de la puissance de l'intellect humain dans la logique[26]). Quoiqu'il fût donc, comme Ramus, un humaniste qui aimait la clarté de la logique et qu'il mît l'„éloquence" en relief, il était aussi, comme Ramus, un ennemi de la confusion de la métaphysique païenne et de la théologie chrétienne[27]).

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[24]) Cf. plus bas XVI.

[25]) Lindroth, o.c. p. 80.

[26]) Dissertatio mathematica de mechanicae artis praestantia. Lemgoviae 1598; o.c. p. 80.

[27]) Lindroth, o.c. p. 81.

XVI

RAMISME ET PARACELSISME

La théologie biblique de Ramus et la théosophie de Paracelse. — Leur „synthèse" discordante. — Causes du déclin du ramisme.

Il est possible que les points que Ramus et Paracelse avaient en commun, la critique d'Aristote, l'opposition à la théologie scolastique, la proclamation de la valeur de la tradition technique et le désir de vulgariser la science en écrivant des manuels en langue vulgaire, ont rendu bien des „novateurs" aveugles aux divergences profondes qui séparaient Ramus et Paracelse. L'histoire montre nettement qu'une certaine alliance du ramisme avec le paracelsisme n'est pas rare [1]).

Cette alliance reposait sur un malentendu: la théologie de Ramus est purement biblique, la théologie de Paracelse prétend aussi l'être, mais en réalité elle est „hermétique" et théosophique. Ramus voulait construire la théologie sur la base de l'Écriture, mais les sciences naturelles sur une interprétation „naturelle" de la nature. Le paracelsisme ne connaissait pas une telle distinction: les deux domaines, celui du „naturel" et celui des choses qui dépassent la raison, furent connus par l'intuition mystique ou par l'exégèse allégorique et hermétique du texte biblique.

Le malentendu est devenu possible parce que la devise raméenne d'une théologie purement biblique fut confondue avec la théologie „mosaïque" des paracelsistes, qui, pourtant, non seulement revêtait un tout autre caractère que l'exégèse rationnelle de Ramus, mais, en outre, était indissolublement liée à une „philosophie" ou „science" mosaïque du même caractère mystique.

Peut-être le fait que le ramisme, tout en rejetant la physique d'Aristote, n'avait pas à en offrir une autre pour la remplacer (comme l'a remarqué à juste titre M. Lindroth), a rendu quelques disciples de Ramus (comme Th. Freigius) plus accessibles à la philosophie mosaïque des paracelsistes.

Mais le ramisme pur désire une interprétation rationnelle de l'Écriture, tandis que le paracelsisme finit par s'abandonner à l'inspiration et l'illumination immédiate. Par conséquent, le ramisme convient à une orthodoxie rationnelle d'allure libre, le paracelsisme trouvera beaucoup d'adhérents parmi les spirituels, les piétistes et les théosophes, tandis que la nouvelle scolastique sera l'appui de l'orthodoxie conservatrice des Jésuites et de l'école de Voetius.

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[1]) Cette alliance a été constatée maintes fois; e. a. par M. Thorndike, Hist. of magic and exp. science T. V.; New York 1941, p. 642 et par M. Lindroth, o. c. p. 59.

Ceux qui louaient Ramus et Paracelse à la fois, ne réussirent pas à créer une synthèse harmonieuse. L'équilibre subtil des éléments „fidéistes" et „rationnels" du ramisme pur, est rompu: la balance est emportée par la théologie (p. e. chez Laurentius) et le résultat c'est la théologie, la philosophie, ou la science pseudo-Mosaïque, un biblicisme non-biblique.

La synthèse de la doctrine d'un savant du type réformé, comme Ramus, avec celle d'un savant du type „spirituel", comme Paracelse, n'aboutit pas plus que l'alliance des puritains bourgeois du type de Cromwell avec les soi-disant „fanatiques", les Levellers, les Quinto-Monarchiens, les radicaux et spirituels, comme William Dell et John Webster: c'est une alliance fondée sur une opposition commune contre un ennemi commun. Un ennemi, d'ailleurs, qui bientôt reprit ses forces sous l'influence de la Contre-Réforme jésuite et sous l'influence de la „contre-Réforme" de ces protestants-là qui, comme Mélanchthon et Bèze, eurent de nouveau recours au „philosophe païen" Aristote. Un théologien réformé comme Voetius soutiendra même un aristotélisme inspiré par les Jésuites de Coïmbre et non pas par quelque réformateur; ses principes d'exégèse ont plus d'affinité avec ceux de la philosophie mosaïque qu'avec ceux de Calvin. Or, bien que le ramisme n'ait pas réussi clairement à délivrer la théologie du joug de la philosophie, ni à écarter l'esprit de système, il a du moins le mérite de l'avoir essayé, d'en avoir reconnu la nécessité.

L'on pourrait se demander pourquoi le ramisme, qui, à ses débuts, avec Ramus lui-même et son élève Péna semblait être prédestiné à un avenir brillant et fécond en matière de science et de philosophie, dégénéra si vite après quelques contributions positives seulement à la science (p.e. celles de W. Snellius). Car il n'y a aucun doute que le ramisme devint en général bientôt un courant philosophique aussi querelleur et stérile que les sectes aristotéliciens. Il y avait souvent la même vénération excessive du maître parmi les ramistes que parmi les aristotéliciens [2]), de sorte que la liberté philosophique ne signifiait plus pour eux que la liberté de suivre Ramus.

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[2]) Cf. Miller, o.c. p. 494.

Les causes de ce déclin rapide sont multiples. D'abord, Ramus ne fit qu'un commencement: les éléments déductifs de sa philosophie devaient bientôt être développés par un esprit beaucoup plus fort que le sien, Descartes; son empirisme devait trouver une expression moins ambigue dans l'œuvre de Francis Bacon, l'apôtre des physiciens et des naturalistes anglais, Newton inclus. Et surtout, comme dans toutes les réformes, le dynamisme du mouvement ne tarda pas longtemps à disparaître. Aussitôt que le ramisme érigea Ramus en demi-dieu quasi-infaillible et commença à jurer par ses paroles, l'élan inspirateur de Ramus perdit sa force salutaire. Le ramisme se pétrifia en un système parmi tant d'autres; l'élan révolutionnaire s'arrêta net.

L'on ne saurait guère en blâmer trop sévèrement le ramisme.Qu'est-ce que les aristotéliciens ont fait de l'empirisme d'Aristote? Le cartésianisme se développa à son tour vite en un système conservateur; dans le newtonianisme les mots du maître étaient vénérés aux dépens de ses intentions véritables. Le nominalisme, le refuge de la théologie évangélique, l'inspirateur d'une philosophie qui nous semble mener droit à la science moderne, était devenu au XVIe siècle la philosophie querelleuse, disputant de subtilités, dont se moquaient Érasme, Vivès et Ramus. Dès qu'il fut devenu une ,,orthodoxie'', il perdit son élasticité et devint une forteresse de conservatisme: c'étaient des nominalistes qui s'opposaient à Wycliff et qui brûlaient Huss. Le même phénomène se présente donc dans le domaine de la religion: la dégénérescence de l'ordre franciscain, la dégénérescence de la théologie réformée, de vivante qu'elle était en un dogmatisme sec et rationaliste, et, après la réaction piétiste contre ce dessèchement de la religion, la dégénérescence du même piétisme en une technique de conversion. En un mot: l'esprit ,,scolastique'', la tendance à la sclérose, est général et n'est pas inhérent au caractère de la philosophie scolastique proprement dite. Il est là partout où l'esprit qui affranchit et donne la vie, est étouffé par la lettre qui tue. C'est une leçon que l'histoire, elle aussi, enseigne à qui a des oreilles pour écouter.

Par conséquent, sans dissimuler ses défauts et la stérilité où il finit par échouer, l'on doit reconnaître que le ramisme original, ainsi que le paracelsisme, préparait l'empirisme plus strict des baconiens, qu'il constituait la transition de l'empirisme littéraire des humanistes à l'empirisme scientifique du temps moderne. Au milieu du chaos du XVIe siècle, dans le curieux mélange de la tradition médiévale, de la renaissance de certains idéaux classiques, et des forces croissantes qui amenèrent la transformation de la vie économique, sociale et religieuse,

se développaient les germes de la science moderne: dans le ramisme se dessinent déjà, en vagues contours, les formes que la science nouvelle va revêtir.

SUMMARY

Ramism is an important link between the "New Learning" of the 16th century (the humanistic revival of classical literature and science) and the "New Learning" of the 17th century (the rise of experimental science).

An analysis of his works and a comparison of them with other writings of the 16th century leads to the following conclusions:

The rise of modern science should be conceived as resulting largely from the combination of humanistic learning and the manual arts.

Humanism helped to undermine the authority of the medieval world picture; it made the treasures of Greek science and mathematics accessible. The tradition of the workshop, of artisans and artists (architects, painters, masons, engineers), offered new problems and techniques and tended to make science more empirical and experimental.

Renaissance humanism shows a yearning for winning back the original freedom mankind was believed to have once possessed. The Ancients are to be regarded as examples of truth and freedom in art and literature, and these examples would be a great help to work man's liberation from the cumbersome scholastic tradition.

The realization of these ideals caused an inner tension in the humanistic world, namely that between "ancients" and "moderns". One could, for instance, feel inspired by classical literature to found a national literature in the vernacular, but one could also be urged by the same example to build up a neo-classical latin or greek literature closely imitating that of the Ancients.

In the same way it was possible to dig up the treasures of mathematics and science of Greek Antiquity in order to enjoy them for their own sake and without taking any interest in applied science, whereas one could also unite the classical heritage with the technical knowledge which had considerably grown during the Middle Ages.

It is impossible to find *one* formula covering aim and method of the whole of Renaissance scholarship; it is equally impossible in the case of many Renaissance scholars to give a consistent picture of their particular system of thought.

At first sight it seems paradoxical that Ramus, who was in many respects a typical humanist of the purely "literary" kind (and "literary" humanism showed in general little appreciation of science), became an ardent apologist of mathematical *practice*, of *applied* sciences, and of *scientific* empiricism.

In explaining this fact the following points should be taken into account:

1. He was, first of all, interested in the educational reform of the faculty of arts and, consequently, started with the reformation of the *trivium* (the three „humaniora" amongst the 7 arts).

He executed his design in conformity with the principles of "literary" humanism, which required that grammar, rhetoric, and logic should not be based upon preconceived rules, but on the *practice* of those people (mostly Ancients!) who followed "nature" and "right reason" when speaking or writing.

This principle Ramus extended to the *quadrivium* (arithmetic, geometry, astronomy, music), which, consequently, he wanted to be founded upon the *practice* of bankers, merchants, architects, painters, and mechanicians. With Ramus we see the transition from the "literary empiricism" (as we styled the above conception of the trivium) of the humanists to the "scientific empiricism" of Bacon.

2. On behalf of this reformation of mathematical teaching Ramus had to look to the applied arts, which inevitably led him to seek contact with the craftsmen in his environment; thus he joined the ranks of those 16th century pioneers of science who sought a renovation by the collaboration of artisans and scholars, a cooperation which would never have found favour with the great examples of humanism, Plato and Aristotle.

3. On the other hand, Ramus would not have been a humanist if, in spite of his "modern" criticism of human authorities and his advocacy of a "free science", he had not tried to back up his views by verdicts of ancient philosophers, and for this purpose he resorted to Socrates.

We have pointed out that this could not be the "Socrates" of the platonic dialogues, who is of the opinion that mathematics should be learned as an introduction to true philosophy (and, besides, for military ends, these being the only "practical" application suitable for a philosopher). The "Socrates" of Ramus was the "Socrates" of Xenophon, who deemed purely theoretical mathematics useless, and advised to go no further in mathematics than is necessary for the practical purposes of daily life.

Ramus' attitude towards Aristotle is ambiguous; he violently attacks scholastic aristotelianism and also some of the authentic doctrines of Aristotle. On the other hand, he believes to have restored in many respects the truly aristotelian doctrine, and he (rightly) confesses that he owes a debt of gratitude to Aristotle. Like many humanists, however, he is more in sympathy with Plato, though his empiricism unavoidably brings him into conflict with some fundamental platonic doctrines. His conception of the function of mathematics in natural sciences is wholly at variance with that of Plato or of platonists like Kepler. With Ramus, in accordance with the new ideas sometimes prevalent in the workshop (as manifest, e.g. with Leonardo da Vinci), mathematics may be highly esteemed, but it should serve to *describe* natural phenomena and not to give a metaphysical or a causal explanation of them.

In astronomy Ramus rejects the description of the planetary movements by means of mathematical fictions and demands a mathematical description of their "real" orbits. Possibly Kepler has fulfilled what Ramus asked. In physics Ramus stresses "observation" as its true foundation; his physics remains purely descriptive and he seems not to have had a right appreciation of the role of scientific experiments: though he went further than most humanists in that he was interested in manual work and entered the workshops, he did not go so far as to use his hands himself in manual operations, or to advise other scientists to do so. Moreover, in spite of his own principles, his physics, though less "metaphysical" than that of Aristotle, is not built upon *personal* observations, but largely upon information from books.

His efforts to establish non-deductive mathematics as a science were a failure from the scientific point of view, but they are important from the pedagogical standpoint; his ideas show some affinity with those of Robert Recorde. Like Vives before him, he emphasized the use of visual means in teaching young people.

Ramus (like Bacon after him), contributed to the rise of modern science, by stressing the observation of nature instead of the ideas of philosophers about nature. In the same way Ramus was an advocate of a theology founded upon the source, the Bible, alone; a theology purged from the influence of pagan philosophy. Through a remarkable confusion, however, some renovators propagated a "Mosaic" science, pretendedly construed upon the Bible. Ramus was not caught in this trap; we have made clear how those Ramists who adhered to "Mosaic" philosophy were influenced by the tradition of "hermetism".

However, Ramus could not avoid another pitfall. Though an enthusiastic supporter of a science free from the prejudices of philosophical systems, he shared the humanists' optimistic belief in "natural" reason. Man, if liberated from prejudice, would think and act in conformity with "nature" in many matters that do not belong to the domain of revealed theology. That means also that right thinking will be conformable to the physical world around us; things are as they appear to the senses and to reason if it is used correctly. Accordingly, Ramus is not only a forerunner of Bacon's empiricism, but he is also in a certain way a precursor of Descartes' rationalism. Here we have one more example of the opposite trends of thought that existed not only among the humanists mutually but also within the mind of one individual humanist.

Bacon made the next step towards the emancipation of science when he posited that the consequences of the Fall had penetrated not only into the realm of religion and ethics but also into that of science; human reason may be unimpaired in its capacity for scientific knowledge, the depraved *will* leads reason into the wrong direction: instead of obeying Nature, we have tried to conceive her in the way *we* think she ought to be. In this view, at least, Bacon was more radically christian than Ramus. To both, Ramus and Bacon, freedom in science and freedom in theology meant the liberation from the bonds of human authority as well as obedience to divine revelation alone, for science revelation in nature, for theology revelation in the Bible. But in Ramus' conception was also included human "natural" reason, in which he had an optimistic belief, at least as far as science was concerned.

Since the publication of Max Weber's famous sociological studies. the question has been much debated whether (calvinistic) theology or economic factors were in the first place responsible for the great popularity, freedom and official support science enjoyed in protestant countries. We venture to suppose, that it may well be that the same kind of people who were inclined to accept a theology that placed man in a relation of freedom towards his fellow-men and which demanded a wholly personal responsibility and obedience to God, — were also attracted by a "new" learning and would eagerly embrace "freedom of philosophizing" even when it went against all sacred traditions.

At any rate, there is a close connection between Ramus' plea for freedom of science and philosophy (philosophia libera) and his protestant religion. It should be added that Ramus himself attributed the flourishing of science in some cases to economic factors, in other cases mainly to the influence of the Reformation.

Ramism had a large influence in Germany, Holland, Sweden, England and New England, and especially amongst the puritans in these last countries. However, the ramist opposition to a blind belief in authorities and its advocacy of a "philosophia libera" were taken over by the divergent currents of Baconian empiricism and Cartesian rationalism. "Ramism" in the proper sense soon degenerated into a new dogmatism, soon animated as it was by a narrow "esprit de système". It was Ramus' logic rather than this advocacy of science and mathematics, that appealed to them. Ramus' role in natural science and mathematics was forgotten because an even more eloquent and unwavering apologist of scientific empiricism arose with Francis Bacon and it was the banner of the latter that the students of experimental science joined.

Ramus' philosophy reflects the chaotic situation from which "modern" thought emerged in the 17th century: its ingredients are aristotelian philosophy, reformed theology, humanism and the practical tradition of the workshops of the burghers. It has been our aim to demonstrate how these ingredients, as represented in Ramism, contributed to the rise of mathematics and science, which constitutes one of the characteristic features of modern culture.

R. HOOYKAAS

WE HUMANS *)

In the months of March and April of this year an exhibition was held in the Municipal Museum of this town, announced with the words "We Humans", a rendering of "The family of Man", the title under which this exhibition was for the first time on view in New York a year ago and which began a world tour since then ¹).

This exhibition has a missionary character. It consists of a collection of photos, more than 500 in number, selected with great care and with a definite object in view from a total of two million, collected from very different parts all over the world. They mean to picture to us the life of man as it is lived in various ways by people, communities of people, nations geographically and culturally far remote from each other and yet in this remoteness related and in all differences one. They are the ordinary and at the same time so wonderful events, experiences that are lived through in every human life in some way or other, the elementary situations by which it is marked, from beginning to end, from birth to death, the boundaries within which human life moves.

This exhibition means to be "A Mirror for Man". In the words of Edward Sleichen who conceived it: "It was conceived as a mirror of the universal elements and emotions in the everydayness of life; as a mirror of the essential oneness of mankind throughout the world" ²). And thus the words "We Humans" are more than a distinguishing designation. They mean a position, I would almost say a creed, and they mean to be an appeal to us that we shall not be mere spectators, that in the stranger we shall recognise the relative, in him that is far remote the neighbour, nay in the other ourselves. "In

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*) Inaugural address delivered on assuming the Office of Professor extraordinarius of Cultural anthropology at the Free University in Amsterdam on Friday, 12 October 1956.

¹) Organised by the Newspaper Concern "Het Parool" in cooperation with the United Nations Information Service.

²) *The Family of Man*, published for the Museum of Modern Art, New York, by the Maco Magazine Corporation, p. 4.

every photograph we are confronted with a human being and each photograph says: That's you" [3]).

I do not forget that another composition and grouping of photographic material collected all over the world would have been possible, neither do I fail to see that behind this grouping lies a constructive thought which aims at producing a suggestive effect [4]); that we are apt to conclude too easily from our own world that the experiences, emotions and reactions of other people are like ours. I do not forget all this when nevertheless in the words "We humans" I hear a indication of what is both basis and condition, and also to what is the object of the branch of science which will henceforth also be studied at the Free University.

We Humans indeed. "We", inclusive, comprising all, you and me, the one with the other; "Humans", living as men in this our world in which we are placed, the earth which He "has given to the children of men" [5]). In spite of all differences, He has made of one blood all nations of men for to dwell on all the face of the earth" [6]). And "dwell" is definitely something different from "reside" here.

Bavinck in his "Zendingswetenschap" has resolved the elenctic discussion into the question: "What have you done with God?" [7]). And thus I hear in our science a question concerning man and his world. What has man done with man, what has he done with the world which has been given him and in all this, what has he done with himself? And it appears in the lives of people themselves that these questions are not separate from the question mentioned by Bavinck.

Let therefore the words "We Humans" be the theme which forms the centre of what I have to say this afternoon.

I spoke of a reference to, not of a formulation of the object of our study. We could speak of a landmark to go by, if we do not wish to miss the right view of our object, of a broader field of study within which our object is situated.

It is not only the students of cultural anthropology who move in this field. There are a good many other sciences which with no less justice could hear in the words "We Humans" a reference to the object of their investigations and which each in their own manner are concerned in this "Being human with others". We find there the students of biology, of medical science, of psychology, history, linguistics, sociology, economic and political sciences, theology. Nor do they ignore each other in complacency, there is a discussion going on [8]). Now a discussion presupposes two different persons distinct from each other, a speaker and a person spoken to, and this very fact raises the question, therefore, what the specific place is and the specific object amidst all the others that cultural anthropology reserves for itself. Here a clearer delimitation would be necessary, but I would draw your attention to the fact that, whether we speak of Social Anthropology, as is the rule in Great Britain, or of Cultural Anthropology, preferably Anthropology without any more, as is done in America, there is everywhere a distinct tendency to keep the boundaries mobile and open and to pay little attention to "scientific borders" and "No trespassing" signs [9]). An out of bounds is hardly known here. Indeed, sometimes, we have the impression that anthropology is considered to be the natural discussion centre where the discussion partners are gladly received and seen.

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[3]) Prof. Dr. C. W. Mönnich, *Wending*, March/April, 1956, p. 77.

[4]) Het Parool, 20 Jan. 1956; Alg. Handelsblad, 23 March 1956; Trouw, 14 April 1956.

[5]) Psalm 115 : 16.

[6]) Acts 17 : 26.

[7]) J. H. Bavinck, *Inleiding in de Zendingswetenschap*, p. 224.

When we peruse "Anthropology Today", the collection of essays published in 1953, which contains the fifty papers contributed to the International Symposion on Anthropology held in America from June 9 to June 20, 1952 [10]), the whole meant as an inventory of the present state of this science, the impression at once heartening and oppressing is one of being placed in a field of scientific research, the borders of which are difficult to define and which finds its unity in its relation to "this wondrous creature Man" [11]). Linton, in his "Scope and Aims of Anthropology" [12]) thinks that the time seems to be ripe for a new synthesis of science, particularly of those sciences which occupy themselves with "human beings and their problems". Per defitionem anthropology in his opinion qualifies for this central place, since it has tried to find out all that can be known "about this curious biped and his still more curious behaviour". He anticipates that Anthropology will become the nucleus of a new Science of Man, so wide in range and scope, that within it all aspects of human existence, civilized and primitive, can be included[13]. And, not to mention more, in his "Foundations of Anthropology" a level-headed theorist like Nadel even calls the students of this science" the pioneers of a synoptic discipline"[14].

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[8]) Cf. Ralph Linton, *The cultural background of Personality*, New York, 1945; A. L. Kroeber and others: *Anthropology Today*, Chicago, 1953; cf. for a discussion from a different angle, the theme of L. van der Horst, *Anthropologische Psychiatrie*, Amsterdam, 1946; J. H. van den Berg, *Kroniek der Psychologie*, 's-Gravenhage, 1953, p. 16; J. Waterink, *Problemen der huidige wetenschappelijke paedagogiekbeoefening*, in *Gesprek der Opvoeders*, een liber amicorum voor Casimir, p. 38.

[9]) R. Linton, Scope and aims of Anthropology, in *The Science of Man in the World Crisis*, New York, 1952, p. 4.

[10]) *Anthropology Today*, An Encyclopedic Inventory, prepared under the Chairmanship of A. L. Kroeber, Chicago, 1953.

[11]) E. E. Evans Pritchard, *Social Anthropology*, London, 1954, p. 129.

[12]) R. Linton, *op. cit.* p. 4.

There is no denying that all this may make a somewhat presumptuous and arrogant impression[15]. All the same these people are no phantasts, but precisely in the way of their investigations, so to say pragmatically, they have come to see that it is not possible to isolate one side of the complicated whole of human life from its other aspects.

At this moment, when assuming my office and the beginning of my work I am probably not expected to give an accurate outline and delimitation of a subject the connectedness of which with other branches is so clearly illustrated by the Higher Education Act. This Act requires candidates not only to possess a knowledge of the principles of cultural anthropology, but also to be introduced into physical antropology, into psychology, into general linguistics and into sociology. I could also refer to Dooyeweerd, who mentions ethnology — and this will no less apply to cultural anthropology — among the sciences which in their present state have not yet delimited their area of research with respect to the modal meaning of a law sphere, so that e.g. its relation to the science of history must be called highly problematic"[16]. I restrict myself now to a few remarks concerning the concept which must certainly be called central for this science — the very name is an indication of this — the concept of culture, more specifically, the anthropological or ethnological cultural concept, taken as a complex, a context in which the content of the words "We Humans" is illustrated from a special side.

So my starting-point is the adjunct cultural in the combination cultural anthropology. This adjunct states a distinction. A distinction, not only with regard to physical anthropology, which occupies itself with the biological, or if this term is preferred biotic existence of man, questions of descent and heredity, of the differentiation of the races, but also of philosophic and theological anthropology, in which connexion it may not be superfluous to remind you of the fact that theological is something different from religious. These other approaches are not separate indeed from the cultural approach, for also in the pursuit of science the principle of the unity of man will apply, but yet cultural anthropology approaches the undivided object from its own angle and examines man as the bearer of culture or examines the culture of man, in which investigations attention is directed, not indeed exclusively but certainly chiefly to those communities that may negatively be comprised as non-western — western not being meant in the geographic sense, but giving a definite qualification — and which I would more positively characterize as communities, that are only slightly differentiated.

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[13] Ibid., p. 17.

[14] S. F. Nadel, *The Foundations of Social Anthropology*, Glencoe, Illinois, 1953, p. 51.

[15] Bronislaw Malinowski, *A scientific Theory of Culture*, 1944, p. 1 ff.

[16] *De Wijsbegeerte der Wetsidee* II, p. 195. The passage has been dropped in the English edition: A New Critic of Theoretical Thought Vol. II, p. 265.

The fact that cultural anthropology has become the designation of the subject which was formerly — and for that matter also nowadays occasionally — called ethnology, is I think more than just a case of conforming to international parlance. I think that we may also see in it an indication of the fact that a special tendency, which had already been noted among others by Locher in 1938, has carried on since then and has acquired almost universal validity 17). Whereas in 1938 Locher still speaks of a point that is at issue, in his oration of 1955 he does not mention it 18) and de Josselin de Jong can say in 1955: At present it is an established fact 19). Surely this change of name loses much of its meaning unless it implies that culture is of real significance for the life of man in community, that it is precisely culture that gives to it its own pattern and character. Now this is just the question asked by Locher in his 1938 article: Does ethnology consider culture as a conglomerate of cultural elements, that is without any binding inner coherence, or to a certain extent as an organic whole? The latter view is according to de Josselin de Jong in 1951 generally accepted and can be stated as follows: "A culture is not an arbitrary conglomerate of manners and customs which has arisen owing to a fortuitous concurrence of historical circumstances, but it is a life-system which can only be understood as system". This does not mean

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17) G. W. Locher, *Ethnologie als Cultuurwetenschap, Mens en Maatschappij.* (1938), pp. 347—359.

18) *De Sociologie en Cultuurkunde van Zuidoost-Azië en het Zuidzeegebied in haar betrekking tot de algemene cultuurwetenschap,* 1955.

19) *Ethnolinguistiek,* Bijdrage Koninklijk Instituut voor Taal, land en Volkenkunde, vol. 107, 1951, p. 161.

of course that this system will always and everywhere appear equally clearly in its unity, that it is impossible that resolving, disintegrating factors can manifest themselves in a culture — the writer mentions this himself — but that even then we can understand such a process only against the background of this unity. This crystalization of the culture concept is highly important in characterizing the present state of our science; a scholar like Radcliffe Brown mentions it as one of the most important characteristics of more recent anthropology [20]); Linton sees it as one of the most significant scientific developments of our times [21]), while Kroeber, one of the most prominent anthropologists in America nowadays, considers the extension and clarification of this concept the most important accomplishment of anthropology in the first half of the twentieth century [22]).

If I now try to make clear the meaning of this culture concept with a few remarks, I attach them to the description of culture given by de Josselin de Jong as "the system of non-hereditary life manifestations — including the products of such life manifestations — of a self-conscious human community", i. e. a human community that distinguishes itself as such from those who stand outside it [23]).

The first thing then that I wish to state here is that culture is a category applying to all humans. It is universal. This position has far-reaching consequences. For in this respect this concept of culture is distinct from what has been called the selective culture concept [24]), which considers special spheres of human activity, e. g. art and science to be culture in contradistinction to others. Our idea of culture, does not imply such a judgement of appreciation, distinguishing for instance higher and lower forms of human spiritual life; nor can we accordingly fit the nations into a certain scheme of primitive peoples, semi-cultured peoples and cultured peoples[25]). This distinction is ruled out here. The case is, therefore, not that among the peoples of all times and all over the world certain peoples can be distinguished from the others as cultured, and then within a certain people a group of prominent representatives of it as culture bearers distinct from the rest of their countrymen, but all peoples are cultured peoples and every man as belonging to a certain human community is a culture bearer. Human existence, therefore, is necessarily cultural existence. As van Peursen once said: "Man lives and exists in his culture as he breathes in the air surrounding him"[26]).

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[20]) Quoted by Locher in the article referred to.

[21]) *The cultural background of personality*, p. 125.

[22]) A. L. Kroeber, *A Half Century of Anthropology*, in *The Nature of Culture*, Chicago, 1952, p. 139.

[23]) J. P. B. de Josselin de Jong, 1. c. p. 161; id. *Cultuur en Droom*, Jaarboek Ned. Akademie v. Wet. 1945 — '46. A wider concept of culture is recognised also outside the more limited circle of anthropologists; see, e. g. C. A. van Peursen, *Cultuur en Christelijk geloof*, Kampen, 1955, p. 5; cf. also H. Bavinck, *Wijsbegeerte der Openbaring*, Kampen, 1908, p. 213; S. J. Ridderbos, *De theologische cultuurbeschouwing van Abraham Kuyper*, Kampen, 1947, p. 7; J. Waterink, *Paedagogiek als wetenschap*, Zeist, 1926, p. 321. Yet the point of view of these authors in defining the concept of culture is different from that of the anthropologists. For a survey and discussion of the various definitions of culture, see *Culture, A critical review of concepts and definitions* by A. L. Kroeber and Clyde Kluckhohn, Papers of the Peabody Museum of American Archeology and Ethnology Harvard University, vol. XLVII, no. 1.

[24]) De Josselin de Jong, Bijdrage Koninklijk Instituut voor Taal, land en Volkenkunde, 1951, p. 161.

His culture. This combination points to a further distinction. Just as is the case with another datum, e. g. language, I can speak of the culture datum in different ways. I can speak of it in general and see it therefore as a definite functioning area, where human life manifests and realizes itself as human life. In the same way I can see language as a definite area of realization of human life, the field of expression and communication by means of significant symbols. Just as linguistics, which has this life-sphere of language for its object, where there is no general human language comes into contact with its object first of all in the multiplicity of the separate languages. Likewise does cultural science, where there is no general human culture, come into touch with its objects first of all in the historically existing cultures of the various peoples.

Both statements, therefore, hold true: on the one hand that culture is a general human category, but also that there is no general human culture. From what has been posited it follows at once that there are no natural peoples. The term nature-people is really a contradiction in itself. The simple fact that every people speaks its own language should have made us very cautious in using the word. If, therefore, in a book which appeared in 1948 and is well-known among us, it says: "So long as man is still subject to nature and a passive attitude is only possible towards her; so long as man forms no more than a part of this nature surrounding him, absolutely subject to the same forces and laws operating in nature . . . so long there can be no question of culture. In this respect the designation of the so-called primitive peoples as natural peoples has to be taken in the full sense of the word" [27]), we cannot but draw the conclusion that the writer apparently never really became acquainted with any of the peoples meant by him here, and must furthermore state emphatically that such peoples do not exist. If we try to realize in some measure what it means to be man, it is difficult to understand how such thoughts can find a place in our views and we cannot but come to the conclusion that the immanent evolutionary view of the trend of human culture has not passed us by without doing some harm.

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[25]) Thus in e.g. J. Wisse, in the chapter on "Volkenkunde" in *Eerste Nederlandse Systematische Encyclopedie III.*

[26]) *Op. cit.* p. 5.

Besides, as "natural peoples" these peoples would really be placed outside the pale of history. Now it need not be expressly stated that culture always presupposes that which is given in nature; in accordance with its nature, culture will in none of its manifestations get free from this. "He has given the earth to the children of men". It is therefore not surprising that the highly differentiated forms of social grouping among the non-western peoples — and certainly not only among these only — have their starting-point in what is given in nature, as e. g. a grouping according to genealogical relationships or to sex or age-differences. But, as is rightly observed by R. van Dijk, the forms of organisation based upon this, often so complicated that one is very far indeed from what is given in nature, are not natural groups and a fortiori not nature-groups, but historical units. That is to say they are forms, manifestations of culture that have attained this form in a manner often unknown to us, but certainly also in the way of human activity and not at any moment free from this activity also nowadays, wherever in the world. Rejecting, therefore, the qualification "natural people" we say at the same time that in accordance with the inclusive character of the "We humans" we are all of us placed together in the one human history in which we all have our place in the manner of normative freedom, in which we are all culturally occupied and in which we all, both formerly and now, western peoples as well as non-western, may be obedient or disobedient.

I said in which we are all culturally occupied. We humans. What do we mean by that? What is this cultural activity?

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[27]) H. Edelkoort in Chapter I of *Cultuurgeschiedenis van het Christendom*, vol. I, Amsterdam, 1948, p. 3. In this chapter the author fixes the boundaries of culture differently, I think, than in his *Inleiding over het begrip "cultuur"*, p. IX. That we cannot see eye to eye with the writer when he states that culture is absolutely *diesseitig*, immanent, appears from the continuation of this discussion.

[28]) R. van Dijk, *Mens en medemens*, Wageningen, no date, p. 101.

In order to find an answer to this I revert to the analogy with language and will start from my own experience[29]).

In examining a language not yet recorded in writing we are again and again reminded in a special way of the fact that language is a mysterious thing, that language, which is after all a complicated system of symbols designating ideas and relations, is really spoken by the speakers who, as we say, have a command of it but generally without knowing anything of the system and structure themselves. I am thinking now of our discussions about the Sumba language in the first year of our stay in the island, in 1926. My informant was a man who spoke his language in its different forms well, in addition a man who was attached to Sumba life with all the fibres of his existence. He was a teacher at one of the local schools and so we could start by proceeding from the Malay forms. In the course of our talks we had come to the ordinal numerals, which he knew in Malay. But he did not succeed in reproducing in the same way the Sumba forms and he maintained that it was not possible to render this group of words in Sumbanese. Now the form to be expected was known to me and it immediately came out when we tried to come to results by submitting a few situations. Then his reaction was very remarkable: "Yes, when we are talking they are there, but not in a row as in Malay", which we might interpret in this way: "I speak them, but I do not know of them". And so it is indeed with the vast majority of speakers and in fact with all of us in daily unintentional speech; we speak what we do not know, or what we do not know and yet do know. Without deliberate intent our word observes the order imposed by the language system. One could almost speak of a law of freedom. And again and again in the speech of each one of us the language system is realised.

It is a wonderful thing. The language we speak is my own language and yet it is not *my* language. It is a datum of a super-individual nature, in which I participate as a member of, as belonging to, a language community which even transgresses the borders of the community living now. But it comes to me from this living community and living in this community I have to submit to its norms and every transgression avenges itself by unintelligibility. As Kuiper says: "The famous swaddling-clothes have indeed been taken away from education, but the child is still "pinned up" in the language suit. With all our "personal" aspirations we ourselves are nevertheless clothed in a social "language suit" [30]).

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[29]) The language datum is frequently used to elucidate a culture. See J. P. B. de Josselin de Jong, *Cultuur en Droom*, p. 2 ff. of the off-print; A. L. Kroeber, *The Nature of Culture*, pp. 107, 115, 125—127, 130, 149.

But this is not all there is to say to it. For the language is my own language, too, and social does not mean that the individual is completely absorbed by it. I can deliberately repeat a person's words, but the acquiring of a language is not repeating it, it is appropriating it, making it one's own. Hence every living language is not a datum in rest, it is not static but dynamic; in each of the speakers this system receives its own shade of expression, in sound, in intonation, in tempo, in the choice of words, in suppleness, or concise terseness of style. Our language also reveals us individually. I may recognise a person by his voice. Overduin speaks in a manner different from that in which de Graaf used to speak and both are right. Although the language is received from the language community and is not free from it a single moment, individual speech is never completely absorbed by it. Thus tensions will remain. What an effort it often is to find the right word or the correct form to give expression to what we wish to convey. And this tension holds for the whole community. In every period the language supplies the needs of the community that speaks it, which expresses itself in it, but it never supplies them fully. And in times of convulsive transitions, of rapids in social and spiritual life, in which the language is confronted with what appear to be new tasks — I am thinking now of modern Indonesian — it is for those who are called upon to give guidance something like a struggle to make the language serviceable to the expression of the needs and thoughts that have just arisen.

I have permitted myself this excursus in order to understand on the analogy of it more clearly how a man, as belonging to his community, functions in his culture. Language is so helpful and illuminating here, because it is one of the most important manifestations of cultural expression itself. Now what is the peculiar feature of this cultural action? I proceed from Josseling de Jong's definition "non-hereditary life manifestations". This means first of all that in our "curious behaviour" we always act in a way, our way, which is not determined by biological, not by natural factors. It is not an instinctive action. It is not so that we must inescapably behave as we do; it may also be done in another way. Yet we are not free agents and left to ourselves. Only the compulsion that operates here is of a different nature, let me say, for the present, of a social nature. Here, too, we participate in this form of behaviour, because we are part of, belong to a definite community, in which we behave as is right, in which a special manner of doing prevails, a definite manner of intercourse, definite values are upheld and recognised, definite thoughts exercise their influence. There is hardly any province of our life in which we are free from this and even in cases where we speak of involuntary reactions, these frequently appear to be conditioned differently, not merely biologically. In his "Mirror for Man" Clyde Kluckhohn tells us of the wife of a merchant in Arizona, who took an almost fiendish pleasure in producing such culturally determined reactions. She would offer her guests delicious sandwiches filled with a meat that seemed to be neither chicken or tuna fish, but still reminiscent of both. On being asked about it, she never gave a reply until each had eaten his fill. Not until then did she explain that her guests had eaten neither chicken nor tuna fish, but the tasty flesh of a newly killed rattle-snake. The immediate reaction to that communication would be vomiting, often in a violent degree, among several of her guests. This biological process was clearly not culture-free [32]).

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[30]) G. Kuiper, *Taal en Maatschappij*, in *Interfacultaire Colleges aan de V.U. te Amsterdam*, 1950—1951, p. 41.

[31]) See A. Teeuw, *Pokok dan Tokoh dalam kesusastraan Indonesia baru*, Djakarta, 1953.

Now our mode of doing is so peculiar to us that it almost becomes a natural characteristic; it has, as we say, become second nature to us. And often we only discover the non-essential, the relative character of much that we consider a matter of course by the contact with other communities, perceiving that it may just as well be done differently. Things are done somewhat differently on the mail steamers of the Rotterdamse Lloyd than on those of the Lloyd Triestino. One of the gains which the study of the science of culture brings us is that by the contact with what is not peculiar to us we learn to distinguish that which belongs to us more clearly, both in its own nature and in its relativity. But the realisation of this truth does not release us from being bound to the rules of behaviour prevailing within our own community.

Chabot relates how the Macassar bride will clearly show her dislike of her future husband; this is, indeed, not found among the natives of Macassar only. He tells us of a marriage of a Macassar young man of noble birth with a girl of one of the distinguished Macassar Indo-European families. At the home of the bride the male party was the cheerful, energetic bridegroom, and she was the radiant bride, clearly enjoying the bouquet of white carnations she had got from him. Arm in arm they stepped into the motor car which was to take them for a following episode of the festivities to the home of *his* parents. Here there was quite a different atmosphere. The dress of the bride was changed; she was made to wear the Macassar bridal costume and was made up in a manner befitting the occasion. When her bridegroom came and ventured a joke, he was peevishly reprimanded. She turned away from him and at the proper moments showed in a collected manner her dislike of her bridegroom, entirely in agreement with the way in Macassar feelings ought to be expressed in this situation [33]). Such are our manners. And there is nobody who can escape them completely. Even those who in our society want to live as bohemians and wish to take as little heed as possible of convention, can only "have their fling" in a limited measure and they can do this, because for their daily needs they can reckon upon others who do follow the customary code. Very soon, indeed, it appears that, if the circle of the bohemian becomes sufficiently strong, it shows a behaviour pattern of its own.

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[32]) Clyde Kluckhohn, *Mirror For Man*, New York, 1949, p. 19.

Now among our manners some things can no doubt be mentioned of which we can say that it's the done thing; that is all that can be stated about it. One just happens to wear a tail-suit with black waistcoat on official occasions, and a white one at a dinner-party, but it can also be done differently. At some universities it is, or was, the custom in the ritual of the inauguration, for the person to be initiated to be conducted into the hall, bareheaded, to leave it again on having been received within the group, after the initiation, amidst the "group members" wearing the cap; but, again, it can be done differently. Yet we should be very much mistaken if we thought that our behaviour, within any community, is nothing else but a conglomerate of manners and customs bound together by relatively fortuitous factors. They show first of all a structural pattern. All over the world they are grouped round definite phenomena of life, ordered and planned according to definite relationships, appearing in definite situations. And these, too, are not connected arbitrarily, but in their structure they are fitted into and controlled by a definite system, they are framed into a large, comprehensive context.

Now several causes could be mentioned that have led to the situation that in our western culture this unity of life, determined as it is by one all-embracing thought, can less easily be demonstrated. In our strongly differentiated society the various functional areas have acquired a much greater independence both with respect to the whole as with regard to each other, so much so that it is not so simple to recognise, see through and preserve the acknowledged necessary unity. Now a thorough investigation, embracing the life of non-western peoples in its entirety has shown us that with these peoples we come into contact with all-embracing life-systems in which nature and man, indeed the whole cosmos is seen in mutual relationship 34). In the order determined by this system every one has his place, knows his place, is localised and knows how he has to behave and the behaviour he can expect of the other. Thus one can move within one 's community with a feeling of safety and security. Here one feels at home and knows where one stands with one's co-members. And every child which is born in any community whatsoever — this holds true from the first moment of its existence — is born under a law, unescapably. In growing up it is then, either more or less designedly, instructed more fully, for which reason culture is sometimes by various authors defined as "learned behaviour" or "social heredity" 35).

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[33]) H. Th. Chabot, *Verwantschap, Stand en Sexe in Zuid-Celebes*, Djakarta, 1950, pp. 197/198.

Presently I hope to tell you why in my opinion these definitions do not do sufficient justice to the cultural existence of man, but first I draw your attention to the fact that, just as the language system dominates all our speech, is realised in it, although the members themselves do not know of it, or only for a very small part, the same must be said of the culture system I mentioned. Much as the behaviour, the position, the relation of each member of the group is determined by it, the members themselves could not explain to you why. It is a wearisome answer, returning again and again when e. g. in the island of Sumba we ask after the meaning of an action, a ritual: *dekumawe patèkina ata ulu* (we follow what has been said by people of olden times) or *pata memamawe* (this has been our custom from olden times) whereby it should be observed that in rendering the word *pata* by custom, we definitely do not do full justice to the content of this word.

Now in every community tradition is a unifying force. On the other hand, however, it remains equally true that my culture is also *my*

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34) J. P. B. de Josselin de Jong, *De Maleische Archipel als ethnologisch Studieveld*, Leiden, 1935; J. van Baal, *Godsdienst en samenwerking in Nederlandsch Zuid-Nieuw-Guinea*, Amsterdam, 1934; G. W. Locher, *The Serpent in Kwakiukl Religion*, Leiden, 1932; (also the notice of Locher's study by Preusz, Sociologus IX, p. 350); H. Schärer, *Die Gottesidee der Ngadju Dajak in Süd-Borneo*, Leiden, 1946; Ph. L. Tobing, *The structure of the Toba-Batak belief in the High God*, Amsterdam, 1956.

35) e. g. R. Linton, *Study of Man*, New York, 1936, p. 80; id. *Tree of Culture*, 1955, p. 3, 24; R. H. Lowie, *An introduction to cultural Anthropology*, New York, 1946, p. 3. See also Clyde Kluckhohn and William H. Kelly, *The Concept of Culture*, in R. Linton, *The Science of Man in the World Crisis*, p. 81 ff.

culture and that culture, too, comes to its own realisation in each of its bearers. Culture, too, is therefore not a static, but a dynamic datum; as a human functional area it can, indeed, hardly be otherwise. It is certainly true that in the non-western societies this *pata*, the word used in West Sumba, or the *huri*, as they say in East Sumba, the adat is a tremendous power in the life of all the members of the community. Nevertheless, its plasticity has frequently been underrated and often a picture has been given of man in these societies which is not confirmed by the experience of those who come into actual touch with these people [36]). I undoubtedly meet in the inhabitants of Sumba people wearing the same "cultural suit," whose life is governed by the same *pata* or *huri*, but each of our acquaintances is a distinct human being, occupying his place in society also after his own kind. And the community knows this and reckons with it. Sumba knows a patrilineal kinship organisation and marriage is as a rule patrilocal in which the woman by her marriage moves into the group of her husband's family; but women are human beings and not things, and he who on the ground of what has been said should think himself capable of determining within the Sumba society the place of any woman in any Sumba home — we ignore outside influences, which are increasingly making their influence felt in these days — is certainly mistaken.

A final remark à propos of the analogy with the life of language. Just like language, culture in a certain period meets the needs of society, but it never meets them entirely. Here tensions remain, the outlet for which is frequently regulated by culture itself by offering several possibilities. But there where the needs or desires of certain prominent individuals or of a certain group in the community are at variance with the tendency prevailing in a culture, these tensions may give rise to considerable changes in the cultural picture. Following up an essay by Sapir: "Time Perspective in Aboriginal American Culture" [37]), Held drew attention to this in his article: "Time Perspective in the Geelvink Bay Cultures" [38]), in which he thinks he can prove that the ancient clan sanctuary among the Waropen, formerly the place where the young men were initiated into tribal life, has disappeared and that the initiation now takes place in a different manner owing to a tension between a new ideal of a rising upper class and the consciousness of the mutual relationship of all clansmen. There is no doubt, he says, that this sanctuary had disappeared before renewing influences had penetrated from outside, which means "that the social change which has brought about the disappearance of the sanctuary, dates from before the outside influences". And he concludes: "In a culture there will always be ideals which only bear with each other in a compromise. In a good many situations the demands made by the group encroach too forcibly upon the psychic life of many. That in every human society with its human ideals, its prophets and its thinkers, shifts have always been possible, seems to be as likely as the expectation that they will always remain possible" [39]). Other instances could be adduced [40]), but those given will suffice to make us feel that also our opposition: static — dynamic, in which we are accustomed to express the difference between western and non-western societies — although it is not without significance — nevertheless in its absoluteness does not do full justice to reality. And that again because of the inclusivity of the "We humans". It is for this reason that I do not consider "learned behaviour" and "social heredity" as definitions of the concept of culture to be satisfactory. It is true, also in the element "learn" the pupil is a factor of no small significance, and I have also got to accept an inheritance if it is to mean something to me, but all the same in the above-mentioned definitions the dynamic element inherent in culture as a human functional area, is in my opinion not done full justice to.

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[36]) C. Snouck Hurgronje, *Advies over codificatie van adatrecht*, Verspr. Geschr. vol. IV, 1, Bonn und Leipzig, 1924, p. 257 ff.

[37]) E. Sapir, *Time Perspective in Aborignal American Culture*, Ottawa, 1916.

[38]) *Indonesië* I, pp. 162—195.

I said that culture is a universally human category and that man does not function in it according to biological laws of nature, but in a socially conditioned manner. I may in addition point out further that culture is a specifically human function. Davis, in his "Human Society" answers the question what constitutes the difference between man and animal briefly with the word "culture" [41]). This specifically human character of culture is now generally recognised. De Josselin de Jong in his address "Culture and Dream" [42]) warns against a wide-spread misunderstanding with regard to what is sometimes called "primitive culture", against the tendency to see "in it a kind of transition phase between animal and human society, characterised among other things by a more instinctive character of the collective manifestations of life, the manners and customs". He emphatically states that pronouncements in that direction quoted by him lack all scientific foundation and are utterly at variance with all that investigations in the field of cultural science have brought to light. "In comparison with the difference between human and animal life", he declares, "all differences between modern and so-called primitive cultures are as nothing. All human culture that we know is equally human and exclusively human". Even in 1936 Linton in his "Study of Man" thinks in connexion with results of experiments in the field of animal psychology that scholars are strongly presumption that the differences between "animal and human mentality are purely quantitative" [43]). In general we can say that in this book attempts are still made to connect the specific of man with and understand it from the sub-human mode of being. We still read there the remarkable statement that if a man could be a white rat or a chimpanzee for half an hour, he could give us a clearer picture of what is going on inside an animal than we can find out in twenty years' experimenting. I do not share this optimism. But in 1955 also Linton in his "Tree of Culture" arrives at the conclusion that the difference between man and animal in the human faculty to learn, to think and to communicate his experience to others is so immense that it becomes a difference not of a quantitative, but of a qualitative nature [44]).

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[39]) *Op. cit.* p. 195.

[40]) See, e. g. A. J. F. Köbben, *De vergelijkend-functionele methode in de Volkenkunde*, Groningen, 1953, p. 7 ff.

[41]) Kingsley Davis, *Human Society*, New York, 1952, p. 3.

[42]) *Op. cit.* p. 8.

Yet it would seem to me that further conclusions will have to be drawn from this fact than is generally the case. I mean by this that when this essential difference is acknowledged, it is a difference that applies all along the line, also in those phenomena of life where we can speak of an analogy in animal life. For these phenomena have been embodied into human life in an essentially different structure and share in this essential difference. Therefore, when Kröber asserts in his "The concept of culture in Science" [45]) that although culture is not possible without society, society is possible without culture and then refers to the fact that also in the animal world remarkable forms of society are found, this conclusion cannot be upheld. We are deceived by the sameness of the word that is used; it is in fact a metabasis eis allo genos. It is not possible to say that a society is a collection of individuals plus something added to it, that something that we share with the termites. Even in those functions immediately connected with our biological existence the same difference applies. Man eats, animals feed. Nor can we say that sexual life gives expression to an animal instinct in man. In saying this I do not forget what a tremendous force these passions may be in human life to such an extent that a man may break from all moral moorings and find himself adrift. But even then when a man is led and dominated by his passions he does not become an animal and he also knows this, he may be called to account.

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[43]) *Op. cit.* p. 68.
[44]) *Op. cit.* p. 7.
[45]) *The Nature of Culture,* p. 119.

If in this connection I add a few words about this specific human nature, I will do this by referring to a curious way of distinguishing Indonesian citizens as to their religion. A distinction is drawn between orang Islam, orang Kristen, orang Hindu dan orang jang tidak beragama, i. e. between Muslim, Christians, those that profess the Hindoo religion and people without "religion", all those that do not fall under any of the three first mentioned groups, apparently because it is not possible in this case to attach the distinction to definite historical figures or clearly marked-off institutions. Now it is at once clear that this distinction is unsatisfactory. The qualification "particularly religious" of Acts 17 would be far more appropriate here.

What is among other things the peculiar feature of human culture? That man never accepts what is given without anything more; he re-forms it, he takes it into his service, he transcends it, he places it in a wider context, he places it in the widest context that he can conceive. Man apparently has an urge to place things; he cannot help thinking about himself and the world, and so especially in the non-western societies we see all functions and all experiences of life placed in this wide context. I could speak to you about the sumba *huri ngangu*, the rules of eating and it is generally known by how many rules and prohibitions the expectation of the birth of a child is surrounded and how they know of the mystery of the fruit coming from the seed which falls into the earth, germinates and grows up, we do not know how.

Allow me a few examples showing this wide context and this remarkable interaction of different spheres of life which we think we rightly distinguished. It concerns the pursuit of literature. As one of the forms of literature in Sumba I mention the *lii ndai*, the history of the forefathers, of the mythical forefathers, the happenings in very ancient times. These are recited at important events in the life of the community or of a group within the community, e. g. the building of a marapu-house, a house that has a special function in social-religious life, or when hauling a heavy gravestone extracted from the earth, or when a rich harvest has been made or when a prominent man in the community has died. We mentioned *lii ndai;* the happenings in olden times. Another significant word constantly recurs here, namely the word *kawunga*, the beginning, for the *lii ndai* speaks of what happened in the beginning, *kawunga wolo pondi, kawunga rawi rato,* the first building of a marapu-house; of *kawunga tèngi tua, kawunga wela watu,* the first hauling of a gravestone; of the first erection of the war-post on which the skulls of the defeated enemies will be hung; of the first taking to wife and to husband. They are directed to the beginning and in the recital present-day reality is as it were taken up again into this first beginning and from there it is fulfilled.

We may further mention the story-telling of the *lii pangerangu* the parables, parables referring to a different kind of reality which is re-asserted here again. Adriani has shown the connexion between literary activity and the growth of the crops [46]). Such a connexion also exists, for a part I must undoubtedly say existed, in Sumba. When the rice has been harvested and still stacked up in the rice-field, has to be guarded, it is the time of the "story-telling." An obvious explanation is, therefore, that in this way the men prevent one another from falling asleep and this will turn out to be more true than we realize on first hearing it. For the telling, which is forbidden so long as the rice has not set, is not only permitted now, but it is the rule; the rule, not only in the sense of custom, but of law. With this "telling" the rice is to be received, being a guest who comes from overseas and people say *naworu na panii budi hi naworu na pangangu:* the words are to increase, then the food will increase as well.

This story-telling has its rules. Two persons are concerned in it, of whom the one tells while it is the duty of the other to answer and to corroborate. The remarkable thing is now that these two persons are not to stand to each other in a definite relation so that they are forbidden persons to each other, in such a way, therefore, that a marriage between them would be excluded. They may consequently be seen as potential marriage-partners. These two now "tell" together the story of Umbu andRàmbu, the Lord and the Lady, as a rule appearing under the name of Umbu Ndilu and Ràmbu Kahi and before the "story" begins Umbu and Ràmbu, the dramatis personae, will be offered sirih-pinang or a young hen will be killed for them, petition being made for direction and guidance and the warding off of possible danger.

The regular theme, however varied, is the ultimate union of Umbu and Ràmbu, the Lord and the Lady, the male and the female character. The narrative is interrupted by singing, twice, four times, but it is only done to the full in the *ana lalu bokulu,* the "great" stories, in which the singing, *panawa,* breaks the story eight times so that two dramatis personae sing their fortunes eight times and in this singing — this is shown by the meaning of the word *panawa* — as it were push on the events. We cannot help associating this number eight with other eights. With the ordering of the cosmos, which with the Sumbanese is determined by the numbers seven and eight, speaking as they do of *pitu ndàne awangu walu ndàne louru,* seven layers of expanse and eights layers of sea, seven layers of upper world and eight of lower world; with the ordering of human society when in the narrative the first human beings are introduced as *pitu kabani mbani walu mawine rato,* the seven valiant men and the eight princely women. Considering all this and the fact that the story tellers are not to stand in a forbidden relationship to each other, the question suggests itself: "Are they perhaps more than story-tellers, may they possibly be personifications of Umbu and Ràmbu themselves, of the Lord and the Lady, the main characters, who in the events narrated attain a union? We cannot get away from the question whether we have not got to do here with a narrative which has a ritual character in which there is a groping after the secret of man and cosmos. Is it not the same act that also works in the fruit that has just been harvested, the guest who came from overseas, who came forth from the womb of the earth impregnated from heaven? Is this economic act, the provision of what has to feed man not brought into connexion here with what is really the *leitmotif* of life, a motif which also speaks again in the two story-tellers whose social relation must not be of such a nature that a marriage between them is forbidden? How wonderful man is in culture. What wide vistas present themselves to him! It is as if he is pushing on towards the boundary of this earth, as if he wants to push through, to do as it were things that are not possible with men.

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[46]) N. Adriani, *Verspreide Geschriften*, II, 387 ff.

I revert once more to Josselin de Jong's definition of culture: The system of non-hereditary life manifestations of a self-conscious human community. Non-hereditary. How fraught with meaning this word is! Non-hereditary, that means: man has manifestations of life which are not biologically conditioned and thus differs from all other natural beings. His life moves on another plane; and yet, how modestly it is expressed. Is it because it is easier for man to speak negatively here than positively? because at bottom, fundamentally science is denied here every position? Can we not say more, be more positive? There is the reference to the community in which man is placed with his fellow-man. And there is the wonderful word system; these life manifestations however different, form a unity. How and from where? What is the power, the influence working in it and behind it? If we try to penetrate into the system we see how man has as it were not been satisfied with himself, man who is not content with man as he has been given, but has to bring man and world into an all-embracing connexion. "This wondrous creature Man".

And now I will mention the very valuable thesis of Dr. Schärer, who died at such an early age: The concept of God of the Ngadju Dayak, in which he works out his proposition that the culture and religion of the Dayak can only be understood from the all-dominating concept of god. He show us this concept of god as a bi-unity of the highest deities of the upper and the lower world, i. e. as the totality of the two aspects of the cosmos, one and united in their distinctness, and starting from this concept, "von der Gottesidee her", he describes to us the various spheres of Dayak life, cosmology, holy land, holy people, holy house, holy ordinances, as characterized by this divine, cosmic bi-unity. The picture drawn by the writer irresistibly suggests a world, a humanity, an ordering of life, a culture stamped as it were by the deity; world and man in his distinct manifestations of life are the image of the deity.

Are we to see it in this way? It is the surprising feature of this thesis that this is exactly not the conclusion of the author. On the contrary. He thinks that the religious system of the Dayak might bear as heading the "durchaus zutreffende Worte" of Feuerbach: "die Theologie ist Anthropologie". The tribe is personified as the eternal, divine and holy greatness, projected into the two highest deities, which like the total community itself form a duality and a unity. The divine bi-unity projection of the bi-unity of tribal life [47]).

Here, however, boundaries are overstepped and more is said than can be established scientifically. And the question rightly posed by van Baal remains unanswered: Granting that as a matter of course here, too, man cannot express himself otherwise than, it is true, in human categories which are at his disposal, anthropomorphously, the wondrous fact remains that man cannot help making such a projection, that again and again he reaches beyond the empirically determinable reality, tries to break through the boundaries and moreover assigns to this unproved and unprovable reality the highest and most decisive value [48]).

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[47]) *Op. cit.* p. 181.

[48]) J. van Baal, *Over Wegen en Drijfveren der Religie*, Amsterdam, 1947, p. 18.

The seventeenth chapter of Acts knows of two boundaries. Man is placed on this earth in a community with others, but in order that "they should seek the Lord, if haply they might feel after Him, and find Him". Also in the pursuit of science, when using the word "man", I cannot get away from what I hear in the Bible as the wonderful secret of human life, man who is the image-bearer of God. This wonderful being, existence and acting of man is only to be "seen" and to be "known", not "von der Gottesidee her", but "von Gott her"[50]. This does definitely not mean that we are now given here a ready norm for immediate judgement, in such a way that we are raised beyond the complications of human cultural life; beyond all relationships in which we can here trace the functioning of man in his culture, both as regards his biological and psychological substratum, and the historical connexions, the social conditionedness and the religious depth. "The earth He has given to the children of man". We do not evade and elude the problems, we are placed in the midst of them. It ought to be — it is not always so — with still deeper reverence for facts and a still keener sense of responsibility. They are, indeed, considered here from a definite viewpoint and that in the conviction that this standpoint is serviceable to the outlook on the problem.

This is the landmark which I mentioned, by which to take our bearings. I have read somewhere: "Es gibt keine innerweltliche Anthropologie". I am convinced that this has been said truly. Then it is also true that there is no intramundane understanding of the human manifestations of life which we call culture, although we shall try to trace all intramundane connexions.

If this is our aim, the pursuit of this science means to make in its way its contribution, so that we humans, western and non-western peoples, may know that we are humans, placed under one call, subjected to one judgement, blessed with one salvation, looking forward to one future "For there is no difference"[51]. It is of a fundamental and therefore inclusive character, this "We Humans".

L. ONVLEE

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[49] Acts 17 : 27.

[50] T. F. Torrance, *Calvin's Doctrine of Man*, London, 1952, p. 23; cf. J. H. van den Berg, *Psychologie en Theologische Anthropologie*, Nijkerk, 1952, p. 26: Man is originally and essentially "second Person".

[51] Romans 3 : 22.

[52] *Op. cit.* p. 7.

NEWS ABOUT THE UNIVERSITY

INAUGURAL ORATIONS

On Friday, the 11th of October 1957, Mr. J. Nathans took up his post as a lecturer in the Faculty of Economics with an oration upon *Delegation of Initiative* [1]).

Here follows a summary:

Business management is generally so extensive that the top management is compelled to delegate initiative to subordinates, who in their turn are compelled to do likewise. By this the well-known advantages of division of labour are realised, not only those in commanding and executive, but also in commanding labour itself.

In the latter category particularisation may take place according to the elements of the tasks of the management or to the task of the executive labour.

Delegation of initiative means that he to whom initiative is given will have to use his own discretion in trying to attain the end envisaged by the person who gives initiative. By this the unity of management is jeopardized. In order to restore this unity the top management checks the manner in which the delegated initiative has been used and the results obtained.

The multiplicity of administrative actions makes eye-supervision impossible; efficient control is generally possible by judging relative results; in other words: by comparing expectations and outcome.

In the organisation of the business the guarantees must be present that these expectations and results reach the bookkeeping department correctly and completely; this department has for its task to compose from these materials a report for the benefit of the management. This report contains, therefore, all the data needed by the management to gauge the condition of the business and its happenings.

Although the activities in connexion with the management control are thus greatly simplified, the fulfilment of this task is too comprehensive for it. For this reason part of the controlling activities are delegated to the bookkeeping department. The necessity to ensure that the latter works up these report data correctly and performs the delegated controlling function in the proper manner, often leads to the creation of a differentiated controlling function.

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[1]) *Inrichtingsleer als toegepaste bedrijfseconomie.* Amsterdam, J. M. Meulenhof, 1957 (20 p.).

Chiefly owing to the separation between the ownership and the top management of the business, and also due to the position in the money and labour market and the fiscal position, third parties may also have an interest in obtaining an insight into the business management.

The report for the outside world is derived direct from the internal report by an efficient grouping and summarizing of minute data occurring in it, which are not of importance for these outsiders.

On Friday, October 11, 1957 Professor L. van Kampen assumed the office of Professor Extraordinarius in the Faculty of Economics with an oration entitled: *Problems round the formation of secret reserves* [1]).

Here follows a summary of Prof. van Kampen's address:

After an historical introduction of the problem of the secret reserves the cause of the phenomenon is investigated. Speaker's opinion is that this cause has to be found in the fact that on the one hand the normal bookkeeping technique is not capable in case of a rise in prices of calculating the exact profit made in a certain period, and that on the other the idea of profit as it is employed by shareholders and most business managements, follows the notion of profit in the technical bookkeeping sense. This is bound to cause difficulties as soon as the payment of dividend has to be decided upon, because the funds to pay the profit often prove not to be present. The profit calculated by the bookkeeper proves not to be real profit, as it is partly re-invested in stocks and means of production (which have in the meantime become dearer) although we cannot speak of extension. This problem is solved by setting aside that part of the profit, which is consequently apparent profit. In connexion, however, with the fact that formally shareholders as well management nevertheless assigned the meaning of profit to the 'bookkeeper's profit', this reservation could not but take place in secret.

Although the phenomenon of the secret reserves covers a larger area than just that of making the apparent profit caused by an increase in prices invisible speaker confines his observations to this phenomenon.

The phenomenon of secret reservation has never with general approval, and almost from the very beginning of its initiation it has been opposed. The notions of truth and clearness of balance-sheet accounts, which had arisen to serve as a weapon against the frequent abuse of balance-sheet embellishment, were also used against the secret reserves. It was considered to be at variance with the necessary honesty and candour to conceal profits. This opposition came especially from the side of lawyers, who did not take into account the economic necessity, which proved, however, stronger than mere theory. Latterly new arguments have been adduced, which do not base themselves on the necessity of making reserves, but which profess to be able to point out a way of replacing the secret reserve by one that is open, namely by means of a special method of drawing up the balance-sheet.

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[1]) *Problemen rond de vorming van geheime reserves.* Arnhem, G. W. v. d. Wiel & Co., 1957 (27 p.).

Then follows a discussion of the various possibilities of drawing up the balance-sheet. Three types are distinguished:

the balance-sheet to determine the profits,
the balance-sheet to render an account,
the capital balance-sheet.

The latter two types show a capital which is higher than that shown by the first type. In consequence of this, corrections have to be made in the figures of profit so as to arrive at the real profit. Special techniques are recommended for the application of these corrections. From the discussion and analysis of these techniques it becomes clear that they do not yield a satisfactory result, since there is a fundamental flaw in them, and that they are not capable of establishing a true and clear separation between profit and apparent profit.

Profit means the commercially true profit, that is to say the profit which after payment admits of the undertaking being continued on the same footing as before. Only when the real capital has remained intact, can there be question of profit.

Lastly it is argued that the technical issue discussed misses the real point. In the question of secret reserves it is not a matter of a balance-sheet technique, but of the relation between the management, who bear the responsibility for the continuance of the undertaking, and the shareholders, who have the control of the distribution of the profits.

In connexion with the still existing misunderstanding about the concept of profits, owing to which, as was stated above, too much value is attached to the profits calculated by the bookkeeper, it remains necessary in some cases that by secret reserves the capital (the real capital) of the undertaking is safeguarded. If, however, the management are in the majority at the general meeting, secret reserves can be dispensed with.

RECTORAL ORATION

On the occasion of the 77th commemoration of the foundation of the Free University the Rector Magnificus Prof. Dr. G. H. A. Grosheide F.Wzn held an oration in a public session of the Senate on Monday 21 October, 1957 on the subject *Curiosities about mathematical terminology* [1].

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[1] *Merkwaardigheden van de meetkunde-terminologie.* Kampen, J. H. Kok N.V., 1957 (27 p.).

It is not exceptional that a mathematician is called upon to set about the task of choosing a term. Whenever he has introduced a new conception, has defined a new operation or has discovered a special case of an object studied quite a long time already, the desirable, even the practical necessity of this may present itself. It may sometimes be a simple matter to answer the question as to the best name to be given to a figure, an operation or a relation, but this is certainly not always the case. The more so as from the definition of an object it never follows unambiguously what name it should bear.

If a number of suitable names have been found, the selection from them may take place on grounds of a very divergent nature. When Apollonius of Perga in the third century before Christ gave the ellipse its name, the chief thought governing him was that a figure must more or less be characterised, by the manner in which it is designated. Naturally this consideration frequently, though not always, constitutes the chief motive in deciding what must be the name of the object. Even then the decision to be taken is not a foregone conclusion, for an object usually has more than one characteristic property and thus it is not surprising that divers terms bear the stamp of the state of scientific research in the time in which they originated.

A phenomenon of frequent occurrence is the fact that in terms there is an associative element. Thus a complex point is not something that contains more than one thing, but a point the coordinates of which are complex numbers, i. e. numbers with more than one kind of units. When we speak of "focus and tensor", this is based on the existence of physical applications.

Sometimes considerations of an axiomatic, philosophical, systematic or aesthetic nature exercise a certain influence. Thus a more graphic terminology is often avoided, because we wish to make sure that it is quite clear that a geometrical theory is nothing else but a deductive system and that only its logical structure is of importance. On the other hand it also occurs that the choice of the word is influenced by the different possibilities of realizing a theory.

Separate attention must be given to intuitionism. Its starting-point is that a thing has only been defined properly when a means has been given to construe it. Continuing this line of thought, many of its adherents decide to reject the principle of the excluded third. By this they are compelled to resort to ingenious methods or more subtle distinctions than are usual in classic mathematics. It is self-evident that this is reflected in the terminology employed.

Now an important question arises. Of course it is possible to cherish a great many wishes in connexion with geometrical language, but is there also a possibility to gratify them? What terms and modes of expression are available and how can they be utilized? In the case, which occurs frequently, that a special type of a certain object deserves to possess a name of its own, the normal procedure is to provide the general name with a further specification. Sometimes this addition gives expression to the property by which the special type is characterised (surface of revolution, conformal mapping). It also occurs that the new type is named after the person in whose work the object was first discussed (tensor of Riemann).

As the figures become more complicated and intricate, the amount of characteristic numbers belonging to it increases and it is becoming more and more difficult to find a suitable name for a following character. If, however, for a group of characters (or also conceptions) with the definition an order has as it were been given as well, the problem solves itself. One single designation will suffice and the characters (or conceptions) can be further distinguished by their ordinals. Thus we say contact of the first or higher order and first and second curvature.

It is clear that in the instances given the nomenclature depends, not only on numbering, but also on the fact that the terms curvature and contact are already present. We have, therefore, no exception here to the practically universal rule that the words and expressions that are used in building-up mathematics have either directly or indirectly been borrowed from the general language. A consequence of this latter circumstance is that there are words which besides their mostly not sharply defined everyday meaning also possess an exactly defined technical sense. Especially in connexion with the foundations the situation occurs that proceeding from a definite word and on carefully analysing the meaning that is attached to it in ordinary parlance, we arrive at the definition of a geometrical conception that can appropriately be designated by the relative term.

In passing to more general figures, an already existing name is on good grounds sometimes retained. This may have curious consequences. Thus there are geometrics in which the name straight line, which is as it were automatically connected with one-dimensionality, is borne by point-sets of two, four or eight dimensions.

In order to build up his science a mathematician not only needs terms possessing an exact, well-defined content. He cannot entirely dispense with undefined words, although he will make an extremely sparing use of them. Of course this fact has to be taken into account in determining the value to be attributed to mathematical theories. This does not, however, contradict the purposefulness of the work of the mathematician, for — although not every one will always be aware of it, and some will, perhaps, not always wish to admit it — it is only based upon this, that in performing his task the mathematician is fulfilling an ordinance of creation. The language of which he avails himself, when he is at work either by himself or together with others, was given him as a serviceable instrument, which rightly makes him suppose that certain terms have by experience and education a content which is the same for everybody.

Meanwhile the introduction of the mathematical terminology imposes certain restrictions on the general language. Once a special geometrical sense is attached to a word, this word can hardly be used in the same context with yet another meaning.

A word is not identical with the conception or the object designated by it. When we speak of a quadric curve and of a conic section, the same figure is approached in the former case from the static, in the latter from the dynamic side, which is also done when certain parameters are said to fix a linear displacement, and a linear connexion. It also occurs that the same word within the domain of geometry itself has more than one meaning (degree, class, cycle). Lastly the circumstance that the original every-day meaning and the technical sense of a word do not entirely cover each other, now causes us to choose a graphic mode of expression, and to avoid it another time. Thus on the one hand we have to reckon with human limitation and imperfection, on the other we have in language such a rich gift that a personal colouring can also be observed in the choice of the terms used in many writings on geometrical subjects.

REVIEW OF BOOKS

Henry Zylstra, *Testament of Vision*. Reflections on Literature and Life,
Education, and Religion. Grand Rapids, Mich.,
Wm. B. Eerdmans Publ. Co., 1958 (234 pp.).

Testament of Vision is the aptly chosen title of a volume containing most of the writings, addresses and letters left by the late Professor Henry Zylstra, whose sudden death in Amsterdam on December 2nd 1956 was commemorated in Vol. IV, 4 (January 1957) of this periodical. The reading of this book testifies once more to the vast learning, deep insight and guiding wisdom of a Chrstian thinker, who has been wrestling with the problem of integrating the best that has been thought and written in the arts, in education, and religion with the Christian faith in an age when meaning and design in life seem to be failing increasingly. Proceeding from the proposition that differing assumptions about life make for a different reading of reality, the author unfolds his vision of reality, which is at once surprisingly broad-minded and religiously defined. Thus in the first part of the book, containing essays on literature and life, the author gives as his opinion that "there is more of you, after reading Hardy, to be Christian with than there was before you read him, and there is also more conviction that you want to be it." And in another plece: "Modern fiction, if it be authentic fiction, is religiously and morally rewarding." Is this the individual experience of an idealist? Or perhaps the statement of an over-spiritual mind and therefore rather dangerous to the morality of the young? But similar experiences are shared by so many others reading reality through the tissue paper of their conception of life. The Dutch humanist poet Marsman, in an essay on the relation of life and art declares: „Het is mijn ervaring, dat ik in een kunstwerk het leven gezuiverd onderga, en dat poezie de enige kracht is ter wereld, die als stimulans tot vernieuwd en verhelderd leven nooit heeft gefaald." [It is my experience that in a work of art I undergo life purified, and that poetry is the only power in the world which has never failed to act as a stimulus to a renewed and clarified life]. If this be so, and there is no reason to doubt it, the discriminating *Christian* (that is the great *proviso!)* will understand his mission and Zylstra does not fail to point out this mission with uncompromising earnest: "Since Hardy's vision of life blossoms up out of the bud of fatalism instead of flowering up out of the seed of Christianity, and since the light falls on it from the wrong angle we must in the knowledge of faith cause it to fall from the right one." Needless to say that here lies a responsibility for all who are called upon to give guidance in the problems connected with the relation of Christianity and culture.

In the second part, containing essays and addresses on education, the author stresses the necessity of a free and liberal i. e. enlightened and refined education pervaded by the genuine Christian spirit. The religious and spiritual cannot exist in a void, in isolation from life. "There is no possibility of finding oneself in the universe of getting one's bearings, of being oriented, in neutral education. Hence the Calvinist challenge is taken seriously that "the Christian must bring the whole range of life — science and art and society and government — under the sway of Christian principle."

In the controversy between the older and the new education, between the traditionalists on one side, and the progressivists, the functionalists. the experimentalists, etc. on the other, the writer sides on the whole with the former, because he thinks it does better justice to the idea of the freedom of the mind, to the specifically spiritual character of the mind as against the so-called "education for life adjustment, which makes of the mind a means, a technique, and a tool." These are observations worthy of consideration, not only in the United States. Knowledge is too often replaced by mere ability, education degraded into a system of training. Utility is becoming the fetish of modern superficialdom. It is the sort of education narrowed down to, and dominated by such considerations as 'is it functional'? (what's the good of knowledge if you're not going to do anything with it?) or 'is it interesting'? It reminds one of a man who looks through a keyhole and fancies he can in this way form an idea about the beauty of the hall beyond. In an article entitled *Formal Discipline Reaffirmed,* the author claims that the rational being of language is its essential part, that the uses of language are ultimately obedient to the law of reason, not to the law of nature. He proposes that in language teaching reason or logic should constitute the norm and standard of expression (p. 167). I am afraid this opinion is held by few linguists today. The notions 'language' and its principles, 'grammar' and its rules, and the 'teaching of language' are not always clearly distinguished, but taking the term grammar and its rules (in connection with the teaching of language) as that which was most present in the writer's mind, it must be feared that his view of a 'reasonable' grammar will lead to the imposition of rules on grammar derived from logical considerations, to a grammar tested by logic rather than to one which aims at registering the facts derived from the observation of actual linguistic usage. There is little difference of opinion nowadays that grammar should in the first instance be descriptive, not prescriptive. The rules of grammar *are* not their usage, it is true, but have nevertheless to be *ascertained* through usage.

Among the essays on religion there is an admirable one on *Liberalism and Dogma.* With keen discernment and delightful irony the author depicts the well-known liberal opposition to dogma. The occasion of this article had been the form of recommendation found on the inside flap of a book-jacket: "In an age of dogma, controversy, and persecution, Browne had voiced one of the first pleas for religious tolerance." Listen how this passage nettles the author into reaction. "This is a typical piece of liberal *dogma*. Consider it. "In an age": that age is the past, of course, an age now well behind us, thanks to liberalism and Browne's share in it. "An age of dogma, controversy and persecution": where you have the one, you have the others — if dogma, then persecution, and then also a passionate bickering about things that cannot be proved. "Browne... voiced one of the first great pleas for religious tolerance"; as always, so here religious tolerance is assumed to be a liberal accomplishment." This is a specimen of excellent analytic thinking which enables the writer to signalise a piece of bravado that could only emerge from the back of the liberal mind. For though, as the writer allusively remarks, the fear of dogma is for the liberal the beginning of wisdom, he, too, has his code of tenets for which he stands firm.

In a selection of personal letters written by the author when he served with the U. S. armed forces overseas, the man behind the vision is revealed to us, a man of unshaken confidence in God's leading at a time when the whole earth was shaking, a man, also, to whom nothing human was strange, as witness his personal *credo* written in the very first letter from New Guinea (May 4, 1944): "I am confident in my spirit of God's leading, that He has command of me. I would like to know the purpose clearly (not that I doubt) but because the vagueness hurts my poise. The are His appointed trials, though, and I will take them on His own terms."

One of the striking qualities of this book is the beautiful style in which it is written. A word fitly spoken is like apples of gold in baskets of silver. So also with the author. The penetrating, logical quality of his thoughts is fittingly enshrined in beautiful language reminding one strongly of the stately prose of the Bible (how could it be otherwise), lending grace and effectiveness to his argument. Only occasionally does there seem to be a lapse from this high standard, manifesting itself in too frequent repetition of the same word or construction (cf. p. 26). Zylstra is a word-conscious artist. He also loves a well carved sentence of which balance and proportion are the chief quality. Many of his sayings deserve to become classic. They are scattered all over the book but I will confine myself to three instances by way of illustration. "Life is bewildering and meaningless without the fixed reference point" (p. 173). "A good many of us are content to leave contemplation to Athens, Buddah and the monks" (p. 185). "Actions must spring from thought, from thought that is seated in worship, in worship that is worship of God" (p. 187).

The volume closes with an impressive list of public writings: addresses, articles, book reviews, books translated from the Dutch, letters and a pageant. Notwithstanding the large variety of subjects treated, the book holds the reader from beginning to end, and he will not lay it aside without feeling a desire to read it again. *Testament of Vision* is the spiritual legacy of a rarely gifted man, a profound Christian thinker who spent his life's energies in the quest for the essential meaning and values of life.

H. SCHREUDER.

T. F. Torrance, *Kingdom and Church.*
A Study in the Theology of the Reformation.
Edinburgh/London, Oliver and Boyd, 1956 (VIII, 168 pages).

This work is a very interesting contribution to the literature about the theology of the Reformation. Professor Torrance deals with the teachings of Luther, Bucer and Calvin concerning the doctrines of the Kingdom and the Church in their relation to Christ. To that end he uses the aspect of eschatology. In a short introductory chapter he gives a general characterization of the eschatology of the Reformation. The Reformers "brought back the original expectations of the Apostles and the early Fathers for a new age in which an earthly future figures as prominently as a heavenly. Moreover that new age was linked once again with the mission of the Church on earth, so that in their proclamation of the Gospel, in their service of the Word made flesh, they believed the new age was already at work in their midst, and that all history was moving under the impact of God's Word towards its goal in Jesus Christ. The new creation was already present within history, and if its presence meant tumult and commotion throughout the world and the Church, that was to be interpreted as the travail of its full appearing. In this way the movement of the Reformation was itself given eschatological interpretation, as an imperfect anticipation of the final movement through which the perfect age was soon to dawn upon the world."

In the following three chapters Professor Torrance tries to characterize in succession the teachings of the Reformers mentioned. He indicates the difference between them by speaking about Luther's teaching as the eschatology of faith, about Bucer's as the eschatology of love, and about Calvin's as the eschatology of hope. The chapter about Bucer is rather brief, it runs only to 17 pages. In his Foreword the author acknowledges that it is out of proportion to the others. He has in view to present the study of Bucer's theology "as an indication that in his writings, particularly his Biblical expositions, the link may be found which, along with modern Biblical theology, may well serve to bring into closer understanding the Lutheran and Reformed Churches." It may be so. But if this was the author's object, I think he has failed to attain it. For the chapter about Bucer really goes to show that this Reformer stands within the sphere of Reformed rather than Lutheran theology. With regard to the doctrine of eschatology Bucer proves to stand midway between the other two Reformers. Professor Torrance himself declares that his position is not essentially different from Calvin's position (p. 89).

No wonder that the book ends in a rather detailed exposition about the difference between Calvin and Luther (pp. 139—164).

In my opinion Professor Torrance has given a simple and well-documented outline of the teachings in question. But is it exactly to the point to distinguish these teachings by using the terms faith, love and hope? In his Foreword the author himself says: "I have followed what seems to me to be an important emphasis in each, although all three of them were united in thinking of the Kingdom of Christ in terms of faith, hope and love." So it is only a matter of emphasis. But in characterizing the various teachings of the Reformers in that way and bringing them under those headings, the author gives a motive for the idea that there is an essential difference between these men with regard to the relation of faith, love and hope. And in reality all three were fully convinced that neither faith nor love nor hope should be lacking. Hence there is something strained in distinguishing the teaching of the Reformers in the manner as Professor Torrance has done in his book.

Entering now into some details, I would observe that it is not correct to lay so much stress upon the *Psychopannychia* of Calvin as the author has done. He wrongly asserts that Calvin published that work already in 1534, once more in 1536 and for the third time in 1542. He says: "This was Calvin's first theological work and from its appearance in 1534 to his death his exposition of Biblical eschatology characterised all his preaching and writing" (p. 90). He evidently depends on the information in the Opera Calvini, *Corpus Reformatorum*, vol. XXXIII, but he did not pay attention to the correction made in vol. XXXVIIIb, col. 38f [1]). Calvin's work in question was published for the first time in 1542, and the text was not the same then as when first drafted. In my opinion Professor Torrance attaches too much value to this work of Calvin.

The quotations from the *Psychopannychia* on pages 92—96 are not from vol. XXXIV, but vol. XXXIII of the *Corpus Reformatorum*. There are only a few misprints in the book. At the end there is a helpful index of names and subjects.

D. NAUTA.

SHORTER NOTICES

Lester de Koster, *All ye that Labor*.
An essay on Christianity, Communism and the Problem of evil.
Grand Rapids, Mich., Wm. B. Eerdmans, 1956 (128 pp.)

Bernard Ramm, *The Pattern of Authority*. 1957 (117 pp.)

Herman N. Ridderbos, *When the Time had fully come*.
Studies in New Testament Theology. 1957 (104 pp.)

N. H. Ridderbos,
Is there a conflict between Genesis 1 and Natural Science?
1957 (88 pp.)

G. W. Bromiley,
Sacramental Teaching and Practice in the Reformation Churches.
1957 (111 pp.)

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[1]) For further details I refer to the edition of the *Psychopannychia* by Walther Zimmerli, Leipzig, A. Deichert, 1932, Einleitung.

These books belong to a series set up by the Eerdmans Publishing Company under the name of Pathway Books. They are designed to help people keep themselves informed on the important subjects and the crucial problems which confront the Christian church to-day. The general Introduction accompanying each of these books says: "The aim of Pathway Books is threefold: (1) to give the latest results of research and reflection by leading evangelical scholars; (2) to make relevant to modern man the basic affirmations of the Christian faith through a consideration of those questions which have come to the foreground of the modern scene...; (3) to display naked the idols of this age and to urge upon modern man a thoroughgoing commitment to Christ and His gospel."

The plan conceived by the Eerdmans Publishing Company deserves our warm approval. And if the five books mentioned higher up may be taken as a standard, the success is guaranteed.

According to the information of the publishers each volume in this series will approximate 128 pages and will appear in uniform format — indeed an appropriate one — at the uniform price of $ 1.50 per copy.

The booklet by Mr. de Koster, Director of the Library at Calvin College and Seminary, Grand Rapids, is a clear analysis of the errors of Marxist social philosophy. There is a fairly extensive Bibliography, only of English titles; nevertheless part of them are translations, e. g. Abraham Kuyper's *Christianity and the Class Struggle*.

The second volume of the series is by Bernard Ramm, Director of Graduate Studies in Religion at Baylor University. He deals with the problem of religious authority. As a matter of course he was obliged to confine himself to the cardinal issues. Some problems are not discussed at all, viz. the problem of Apologetics, of Hermeneutics and of Biblical criticism. There are chapters upon the concept of Authority, upon the principle and pattern of Authority in Christianity, and upon critique of some competitive systems of religious Authority, viz. Roman Catholicism, Religious Modernism, the Kerugmatic School and Neo-Orthodoxy (especially Barth). At the end a selected Bibliography has been added.

Herman Ridderbos, Professor of the New Testament at Kampen, Netherlands, gives five short studies on the following subjects: The Kingdom of God according to the witness of the Synoptic Gospels; The significance of the Sermon on the Mount; The redemptive-historical character of Paul's preaching; The Law of God in Paul's doctrine of Salvation; and History of Redemption and the Scriptures of the New Testament. There is no bibliography, neither are there any references in the text of the various studies.

This is different in the booklet of N. H. Ridderbos. Professor of Old Testament studies at the Free University of Amsterdam. There are twelve pages of notes. A few years ago Professor Ridderbos gave in a lecture his reflections upon Genesis 1. This lecture has been translated by John Vriend. Readers of this Quarterly may be considered to be acquainted with Professor Ridderbos' views, who published an article in it.

G. W. Bromiley, rector of St. Thomas' English Episcopal Church in Edinburgh, Scotland, has given a first-rate study upon the subject he dealt with in his booklet. He confines himself mainly to the Reformed conception of the Sacraments. He pays much attention to the Biblical argument. The chapters are: The two Sacraments; Holy Baptism; The Administration of Baptism; Problems of Baptism; The Lord's Supper; The Administration of the Lord's Supper; The Real Presence; and the Eucharistic Sacrifice. In his conclusion the author says: "In the present study we have seen little cause to dissent from the Reformation fathers; but it is of the very essence of their own approach that we should be prepared to do so, to correct, amend, or re-state their teaching, if ever our study of the Bible should lead us in this direction. A mark of genuine Reformation teaching is that it is not fixed or static, but always reformable under the word of God." In this we can heartily agree with the author.

In short, the Pathway Books are very helpful books.

D. NAUTA

Albert Nicole, *Judas the Betrayer*. Translated from the French. Grand Rapids, Mich., Baker Book House, 1957 (81 pp.)

This booklet was first published in the French language in 1924. But it still deserves to be read. The publishers have done well to provide this translation in English.

There are three parts, each of them giving a meditation upon a text from the Bible, viz. John 6 : 70: Have I not chosen you twelve, and one of you is a devil; Matthew 26 : 25: Then Judas, which betrayed him, answered and said, Master, is it I; and Luke 22 : 48: Judas, betrayest thou the Son of man with a kiss.

The subtitle is: A psychological study of Judas Iscariot. So it is in indeed. Above all the book has a practical character. The reader is made to retire into himself and to see himself in the pages of this book.

D. NAUTA

The article in this number of Free University Quarterly was contributed by:

Professor Dr. L. Onvlee.

Professor Onvlee was born in 1893. He studied Theology at the Free University, Amsterdam, and Indian Literature at the University, Leiden, where he obtained his degree in 1925 on a thesis *Enkele Soembase Vertellingen* (Some Sumbanese Stories). In 1926 he went to Indonesia as a representative of the Netherlands Bible Society for a translation of the Bible. In 1956 he was appointed Professor Extraordinarius in the Faculty of Arts to give lectures on Cultural Anthropology.

TABLE OF CONTENTS

ARTICLES

Page
The wise men in Israel by *W. H. Gispen* 1
The secret of the administration by *S. Gerbrandy* 19
Crime and religious profession by *H. Bianchi* 24
Aspects of death in medicine by *A. W. J. H. Hoitink* 43
Man in philosophy by *S. U. Zuidema* 77
The nature of human geography in the light of the ordinances of creation by *G. de Jong* 97
The divine mystery in history by *M. C. Smit* 120
Humanisme, Science, et Réforme by *R. Hooykaas* 167
We humans by *L. Onvlee* 295

NEWS ABOUT THE UNIVERSITY

Rectoral oration 67
The Free University and Hungary 67
Academic Hospital 67
Annual change of the rectorate 67
Inaugural orations 68
Dissertations 146
Inaugural orations 316
Rectoral oration 318

REVIEW OF BOOKS

Exposition of I&II Thessalonians (New Testament Commentary) by *H. M. Matter* 73
Elementary Hebrew by *W. H. Gispen* 74
Shorter notices by *D. Nauta* 74
Testament of Vision by *H. Schreuder* 322
Kingdom and Church by *D. Nauta* 325
Shorter Notices by *D. Nauta* 326